

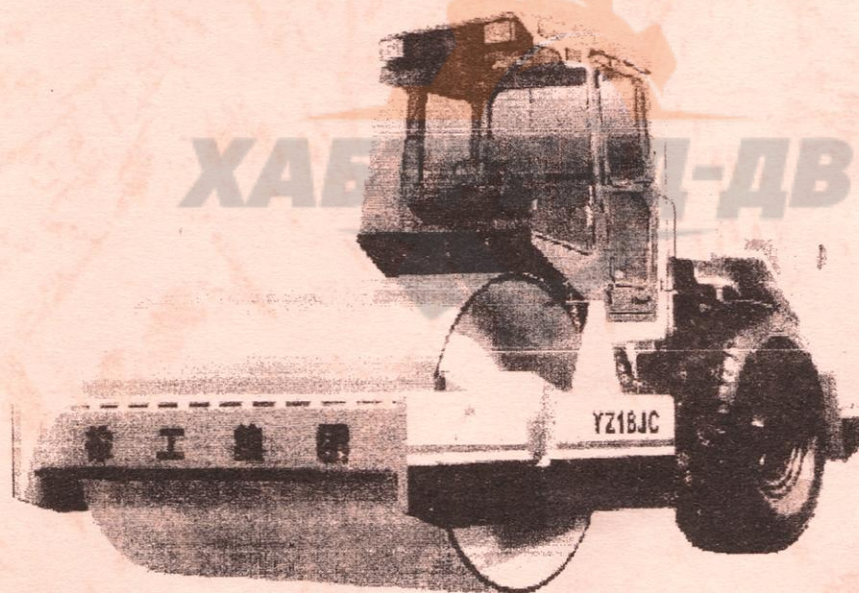


YZ16JC、YZ18JC 振动压路机

VIBRATORY ROLLER

使用保养说明书

OPERATION AND MAINTENANCE MANUAL



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THE PEOPLE'S REPUBLIC OF CHINA

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第一章 前 言

欢迎您购买我厂生产的 YZ16JC、YZ18JC 型振动压路机(见图 1)。

YZ16JC、YZ18JC 型振动压路机系自行式多用途振动压路机，可以有效地压实各类土壤铺层及岩石填方，适用于现代化高速公路、机场、路堤填方、海港、大坝、铁路、矿山等需要各种压实深度及高效率的工程建设施工。

该机的主要特点是液压振动、机械驱动、铰接式全液压转向。该机还具有振动质量大、单频双振的特点，可以高效地压实不同厚度的各种铺层。液压振动系统采用变量柱塞泵和定量柱塞马达组成的闭式液压系统，确保了振动参数所要求的各种性能；机械传动装置由三档变速机构、换向机构和差速机构三部分组成，确保了该机的高机动性和爬坡性能，全液压转向器使转向操纵更灵活。

该机采用铰接式梁式车架，便于维修保养；三级减振和密封隔音的驾驶室，为操作人员提供了舒适、安全的工作条件。

在您使用本机之前，请您仔细阅读本说明书，它能帮助您了解本机器的性能、特点、操作保养、维修等基本知识，以避免由于操作或使用不当而引起的故障。提高机器的使用可靠性、延长机器的使用寿命，更好地为您服务。

使用说明书中所列的主要技术性能数据，仅作为用户了解压路机性能参数之参考，不作为压路机验收之依据。参数如有更改，恕不另行通知。

有关柴油机的使用说明，请看柴油机使用说明书。

如果您严格遵守本说明书的规定，YZ16JC、YZ18JC 型振动压路机的工作定会使您满意。

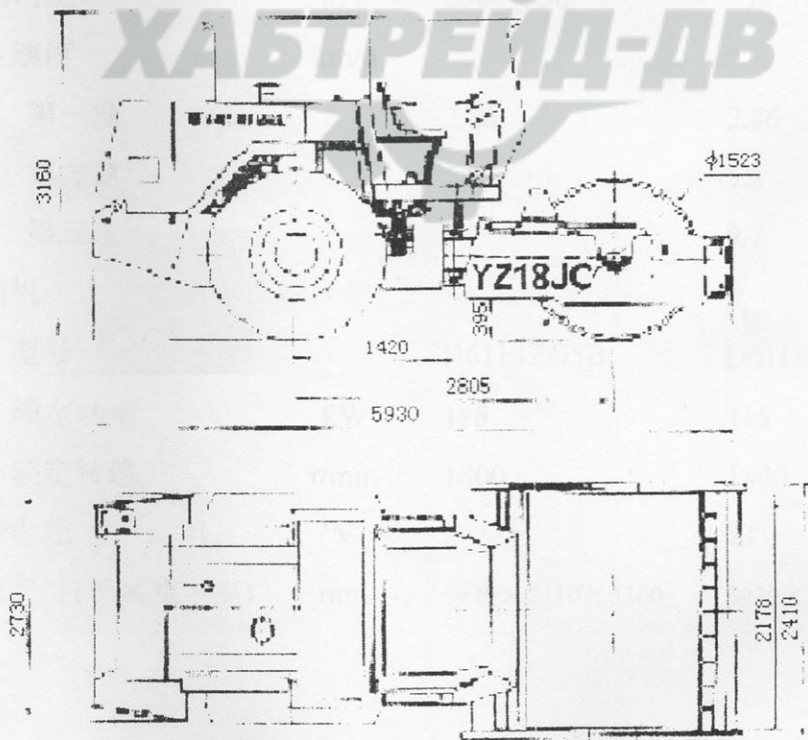


图 1 YZ16JC、YZ18JC 振动压路机外形图

第二章 技术性能参数

产品型号	单位	YZ16JC	YZ18JC
工作质量	kg	16000	18000
振动轮分配质量	kg	8300	8500
驱动轮分配质量	kg	7700	9300
静线压力	N/cm	355	390
激振力	kN	150/300	190/330
振动频率	Hz	28	28
名义振幅	mm	2.0/1.0	2.1/1.1
压实宽度	mm	2178	2178
最小转弯半径	mm	≤6500	≤6500
最小离地间隙	mm	395	395
爬坡能力		30%	30%
轮胎型号		18.00-24	18.00-24
轮胎内压	kPa	250~350	250~350
行走速度	km/h		
第一速		2.86	2.86
第二速		5.3	5.3
第三速		9.7	9.7
柴油机			
型号		D6114ZG5B	D6114ZG5B
额定功率	kW	115	115
额定转速	r/min	1800	1800
起动电压	V	24	24
外形尺寸(长×宽×高)	mm	5930×2410×3160	5930×2410×3160

第三章 安全操作规程

一、总则

1. 压路机驾驶员必须经专业培训考核合格后方可上机操作。
2. 驾驶压路机前要了解压路机的各个部分，精通压路机的工作性能，熟悉其所有操作及操作系统。
3. 本机适用于道路基础层、次基础层的压实，严禁在高密实材料如水泥或沥青路面上使用振动。
4. 当柴油机运转时，不能站在压路机的铰接处。

开机前：

1. 开机前要参照操作说明，检查各部位，如铰接螺栓、振动轮连接螺栓等是否松动，并检查变速箱、液压油箱、离合刹车油杯内刹车液、振动轮润滑油位等是否正常、可靠；
2. 任何仪表、灯具或操纵元件出现问题时，则不能使用机器；
3. 柴油机起动前，变速、倒顺操纵装置，必须在“空档”位置上；
4. 在开动前，驾驶员要确保压路机附近或下面没有任何人员或障碍物；
5. 在柴油机运转时，驾驶员不能随意离开压路机。

二、开机

1. 在开机前，应检查所有仪表、方向盘、制动系统、车灯和喇叭是否正常、是否安全可靠；
2. 在倒车时，要确保路面没有任何人或障碍物；
3. 在有坡度的地面特别注意，要直线上下坡，决不能有斜角，在接近坡道时要使用一档速度；
4. 在坡道运行，不允许将发动机熄火，以免转向失灵；
5. 压路机在坡道上，如果必须换档或换向，则一定要在停车制动后进行，下坡时，严禁脱档滑行。
6. 不准用压路机运送人员；
7. 压路机在行驶时，不要爬车；
8. 在操作压路机时，要注意是否有异常声音或烟雾，当发现机器出现任何故障时，要立即停机检查；
9. 只有在平直道路及良好的路面条件下，才能开最高速，最长运行距离不得超过 30 公里；

三、停车

1. 在离开压路机前，要使变速、倒顺操作杆在“空档”的位置，发动机熄火，并拉紧手刹车；
2. 如果压路机必须停在坡道时，要把压路机停放在与坡道垂直的位置上，并在轮下放上

楔块；

四、维修和保养

1. 在进行维修保养工作时，要保证压路机的水平和稳定；
2. 在维修压路机时，要用支撑物保护铰接架；
3. 在给油箱加油或检查电池的硫酸液面时，禁止烟火；
4. 检查液压系统时，首先要检查系统压力是否已降低，维修液压系统时必须停机方可拆卸液压管路。

五、警示说明

1. 压路机进行压实作业时，柴油机油门必须拉至最大位置，即达到柴油机的额定转速，方可打开振动开关。
2. 严禁在高密实材料上使用振动，密实度超过 90% 时严禁使用高振幅压实，禁止在原地使用振动。
3. 本设备适宜基础层，次基础层压实，不适宜面层压实。
4. 压路机在松软土壤工作或单轮（双轮）陷入泥水时，应锁死差速，正常运行压实工况应处于差速状态。在运行状态下长时间锁死差速，极易造成侧传动损坏。



第四章 主要结构综述

一、概述

YZ16JC、YZ18JC 振动压路机是专门从事机场、矿山、道路和其它一些大型工程中压实工作的一种重型自行式振动压路机。

YZ16JC、YZ18JC 振动频率为 28Hz，两个振幅，它特别适用于基础压实和填方压实。

该机由铰接式车架、驱动轮、振动轮、动力装置、传动装置、侧传动、液压振动、液压转向、操纵机构和电器设备等主要部分组成。

振动轮安装在前铰接车架上，它具有一个频率两个振幅。振动轮与车架之间装有减振器，隔绝振动轮的振动，以防振动传到车架。

驱动轮是两个充气轮胎，位于车架两侧，它隔离地面上的振动传递到车架，动力靠差速轴通过侧传动传动到驱动轮。

发动机采用上柴 D6114ZG5B 型柴油机，安装在后车架上，柴油机与后车架之间装有减振器，隔离柴油机的振动传到车架，柴油机的动力分两路输出，一路传到变速箱，一路传到液压泵。

传动装置位于后车架中部，它包括三档变速机构、换向机构、差速机构三部分，使压路机获得前进、后退各三档不同速度且转弯时两个驱动轮获得不同的转速。

操纵平台和驾驶室装在后车架前端。司机座椅与平台之间装有减振装置，以隔绝车架上振动传给驾驶人员。

液压系统上装有测压点，便于掌握及调整系统压力。转向系统采用全液压转向器使转向操纵轻便灵活。

电器系统装有照明设备，便于雾天或夜间作业，还装有故障自动报警设备，以及时排除故障，延长压路机使用寿命。

车架为铰接式梁式结构，便于维修保养。

二、传动系统

压路机的传动系统如图 2 所示。柴油机动力分别由飞轮和分动箱两路输出。

柴油机 1 的动力通过离合器 2 传递给输入轴齿轮 3，因而带动齿轮 23 使变速轴 20 及固定在该轴上的齿轮 22、21、19 三个齿轮旋转。再分别通过滑动齿轮 4、6、7 与变速轴 20 上的齿轮 22、21、19 啮合，使传动轴 5 获得三种不同转速，使压路机获得三种不同的工作速度。即：齿轮 7 与齿轮 19 啮合时得第一速；齿轮 6 与齿轮 21 啮合得第二速；齿轮 4 与齿轮 22 啮合得第三速。

传动轴 5 的末端固定小伞齿轮 8，小伞齿轮 8 恒与两个大伞齿轮 10 相啮合，由小伞齿轮带动两个大伞齿轮，分别作相反方向旋转。换向齿轮 16 左右滑动，分别与两个大伞齿轮的内齿 9 相啮合，从而得到两个相反方向的旋转，使压路机前进或后退。

换向齿轮 16 恒与差速器的大齿轮 13 相啮合，带动差速器 12 旋转。动力由左右半轴 11、14 输出，通过两侧的传动齿轮 15、17、18、24 带动两个轮胎转动，使压路机获得作业速度。

柴油机 1 的另一路动力通过花键直接带动双联齿轮油泵 26 旋转，使压路机获得转向和振动。

表 1 传动齿轮一览表

图 位	齿 轮 名 称	数 量	齿 数
3	齿轮轴	1	17
4	三速变速齿轮	1	28
6	二速变速齿轮	1	37
7	一速变速齿轮	1	45
8	小伞齿轮	1	23
9	倒顺车内齿	2	15
10	大伞齿轮	2	27
13	大齿轮	1	54
15	小齿轮	2	24
16	倒顺车齿轮	1	15
17	侧传动大齿轮	2	52
18	侧传动小齿轮	2	24
19	变速轴齿轮	1	15
21	二速齿轮	1	23
22	三速齿轮	1	32
23	变速齿轮	1	43
24	齿轮	1	56
27	小齿轮	1	31
30	大齿轮	1	37
图5 3	差速器大伞齿轮	2	30
图5 2	差速器小伞齿轮	2	15
图5 10	差速器联锁内齿轮	1	36

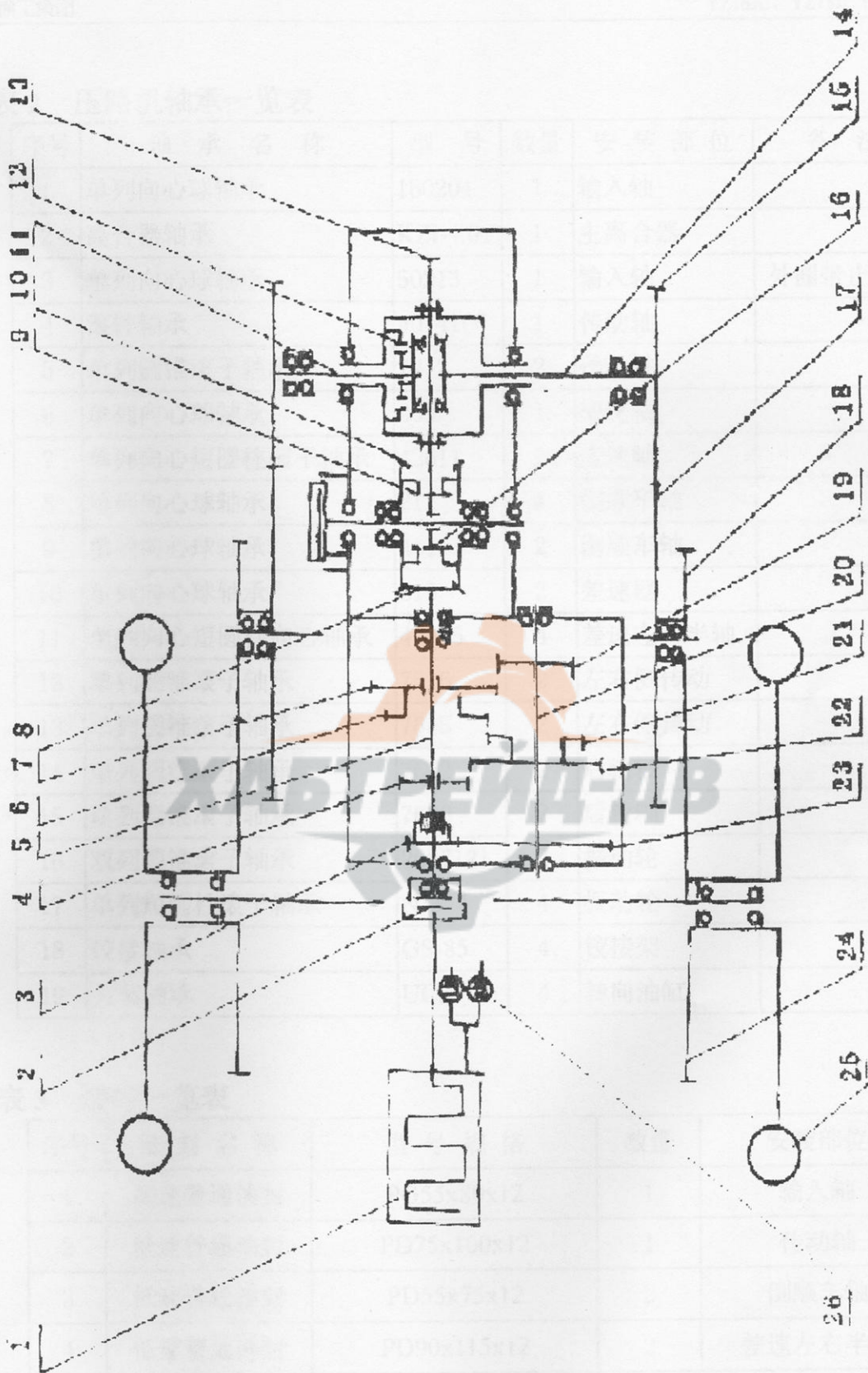


图2 传动系统图

表2 压路机轴承一览表

序号	轴承名称	型号	数量	安装部位	备注
1	单列向心球轴承	160204	1	输入轴	
2	离合器轴承	KZI-4.0	1	主离合器	
3	单列向心球轴承	50213	1	输入轴	外圈带止动槽
4	滚针轴承	4074106	1	传动轴	
5	单列圆锥滚子轴承	7212	2	传动轴	
6	单列向心球轴承	309	1	变速轴	
7	单列向心短圆柱滚子轴承	42611	1	变速轴	
8	单列向心球轴承	212	4	倒顺车轴	
9	单列向心球轴承	411	2	倒顺车轴	
10	单列向心球轴承	219	2	差速器	
11	单列向心短圆柱向心轴承	42215	4	差速左右半轴	
12	单列圆锥滚子轴承	7516	2	左右侧传动	
13	单列圆锥滚子轴承	7518	2	左右侧传动	
14	单列圆锥滚子轴承	7622	2	后轮轴	
15	单列圆锥滚子轴承	7620	2	后轮轴	
16	双列圆锥滚子轴承	2007121	2	振动轮	
17	单列短圆柱滚子轴承	NJ324	4	振动轮	
18	铰接轴承	GS-85	4	铰接架	
19	关节轴承	UC35	4	转向油缸	

表3 油封一览表

序号	油封名称	型号规格	数量	安装部位
1	高速普通油封	PG55x80x12	1	输入轴
2	低速普通油封	PD75x100x12	1	传动轴
3	低速普通油封	PD55x75x12	2	倒顺车轴
4	低速普通油封	PD90x115x12	2	差速左右半轴
5	低速普通油封	PD180x220x18	2	振动轮

三、变速箱总成

变速箱总成用来传递动力，是传动系统的主要部件。它具有变速、换向和差速三种作用。

图 3 所示为变速机构，它位于变速箱的前部。3 为动力输入齿轮轴，5 为传动轴，传动轴上装有可以滑动的一、二速齿轮 7、6 和三速齿轮 4，20 为变速轴，轴上固定有主动齿轮 21、22、19 和被动齿轮 23，各轴分别由滚针轴承、滚珠轴承、圆柱滚子轴承及圆锥轴承支承。在传动轴后端装有小伞齿轮 8，它与换向机构的两个大伞齿轮互相啮合。

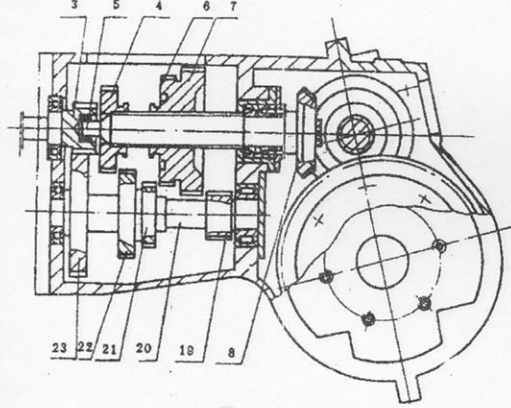


图 4 所示为换向机构，位于变速箱中部，在传动轴后端固定有小伞齿轮 8 与两个大伞齿轮啮合。两个大伞齿轮在换向轴 3 上作相反方向的空转，当滑动换向齿轮 16 与任一个大伞齿轮内齿啮合时，使 16 得到不同方向旋转而起到换向作用，齿轮 16 与差速器的大齿轮啮合。

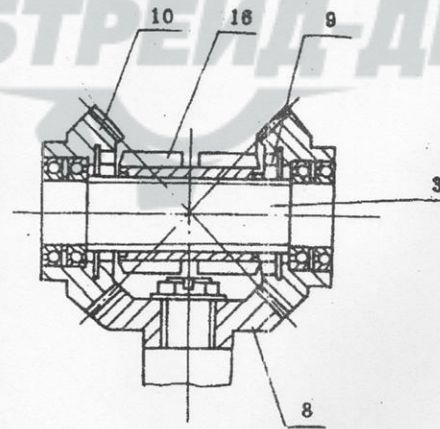


图 5 所示为差速器及差速联锁装置，安装于变速箱的后部。

差速器的用途是使压路机在转弯时，两个后轮能以不同的速度旋转，保证压路机的合理转弯，并防止拖坏路面。差速器系采用伞齿轮式，大齿轮 13 与两个差速器半壳 4 及 8 固定在一起，小伞齿轮 2 及 7 装在同一个齿轮座 6 上，6 装在差速器壳上与差速器一起旋转。大伞齿轮 3 及 9 通过花键与差速器半轴 5 及 11 连接。动力由换向齿轮传给大齿轮 13，使差速器壳及齿轮座随 13 一起旋转，两个小伞齿轮作公转，带动大伞齿轮 3 及 9 作同方向的等速旋转，使压路机作直线移动。当压路机向右转弯时，右边的后轮所受的阻力比左边的大，阻力通过差速轴 5 传给大伞齿轮 3，这时小伞齿轮 2 及 7 在公转的同时还作自转，使大伞齿轮 9 比 3 转的快，使两个后轮起差速。同样，在向左转时左边的后轮转的慢些。

差速联锁装置是使差速器不再起差速的一个机构。压路机在作业或行驶中，常会遇到一个后轮下面碰上石头或陷入泥坑，使压路机后轮发生打滑现象，此时若将差速联锁装置接合，可以帮助压路机克服后轮打滑现象，使压路机越过障碍物。

内齿圈 10 与差速器壳连接，能在差速器壳上滑动，当滑动齿圈使其内齿与大伞齿轮 9 的

三、变速箱总成

变速箱总成用来传递动力，是传动系统的主要部件。它具有变速、换向和差速三种作用。

图 3 所示为变速机构，它位于变速箱的前部。3 为动力输入齿轮轴，5 为传动轴，传动轴上装有可以滑动的一、二速齿轮 7、6 和三速齿轮 4，20 为变速轴，轴上固定有主动齿轮 21、22、19 和被动齿轮 23，各轴分别由滚针轴承、滚珠轴承、圆柱滚子轴承及圆锥轴承支承。在传动轴后端装有小伞齿轮 8，它与换向机构的两个大伞齿轮互相啮合。

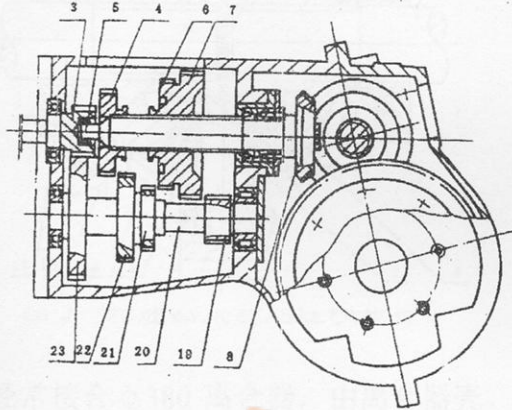


图 4 所示为换向机构，位于变速箱中部，在传动轴后端固定有小伞齿轮 8 与两个大伞齿轮啮合。两个大伞齿轮在换向轴 3 上作相反方向的空转，当滑动换向齿轮 16 与任一个大伞齿轮内齿啮合时，使 16 得到不同方向旋转而起到换向作用，齿轮 16 与差速器的大齿轮啮合。

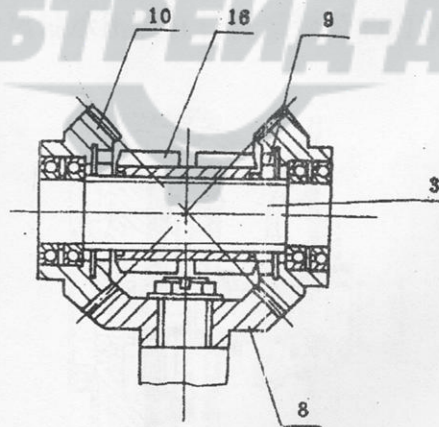


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差速联锁装置是使差速器不再起差速的一个机构。压路机在作业或行驶中，常会遇到一个后轮下面碰上石头或陷入泥坑，使压路机后轮发生打滑现象，此时若将差速联锁装置接合，可以帮助压路机克服后轮打滑现象，使压路机越过障碍物。

内齿圈 10 与差速器壳连接，能在差速器壳上滑动，当滑动齿圈使其内齿与大伞齿轮 9 的

外齿啮合，9 与 8 便连成一体同速旋转，使小伞齿轮 2 与 7 不能自转，故大伞齿轮 9 和 3 不能差速，只能等速旋转，使差速器失去作用。

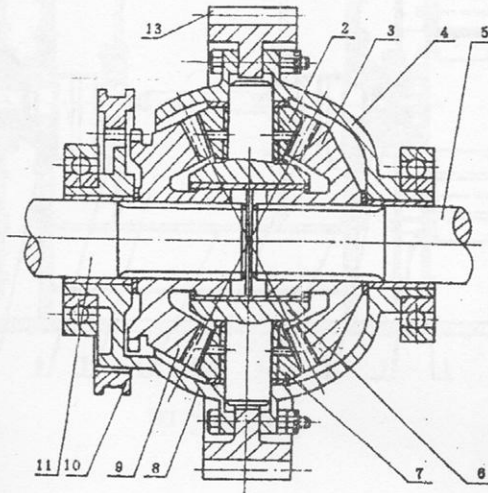
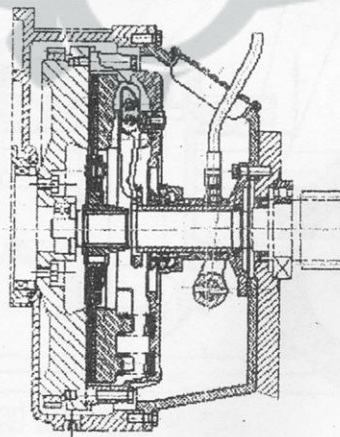


图 5 左速前及左速后锥齿且

四、主离合器

主离合器是采用干式单片经常接合 $\phi 380$ 离合器，由离合器壳、从动盘总成、压盘总成、弹簧及有关部件组成。它位于发动机和变速箱之间，主要功能有：(1) 是连接发动机与变速箱的传动装置；(2) 传递发动机的动力；(3) 当传动系统在作业中产生冲击时，减轻各传动件的撞击。如图 6 所示，离合器压盘通过螺栓固定在柴油机飞轮壳上，由于弹簧的作用，从动盘压紧在飞轮端面上，随飞轮一起旋转，将动力通过从动盘的花键传到输入轴，进入变速箱。要使离合器脱开，将滑动分离轴承压迫杠杆克服弹簧的力量，使从动盘与飞轮端面分离，柴油机空转。



五、振动轮

振动轮是由自身重量及内部的偏心块高速旋转产生激振力进行压实的装置，它的结构如图 7 所示。两个活动偏心块用两个圆柱滚子轴承支撑在轴承座 8、10 上，轴承座与轮体 6 固定在一起。两个活动偏心块由传动轴 7 连接，轴承座 10 由两个锥轴承支承在与减振器 2 连接的轴承座 4 上，减振器支板 11 经螺栓与减振器 2 和框架相连。花键套 3 花键连接活动偏心块和固定在端盖 1 上的振动马达连接。动力输入带动活动偏心块旋转，产生激振力。由于振动马达能正、反转，因此活动偏心块同样产生正、反转。改变活动偏心块偏心距，产生两种振幅。

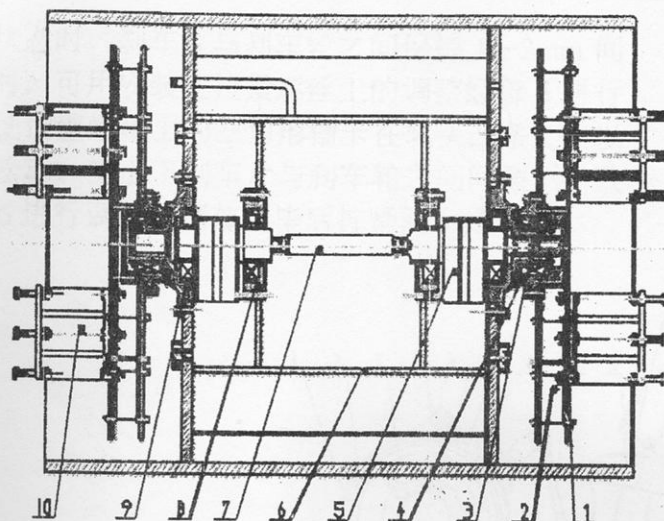


图 7.振动轮

六、后轮及侧传动

后轮是两个驱动轮，位于机架两侧，其结构如图 8 所示。后轮借助于后轮轴 2 固定于机架，轮毂 3 借助于滚动轴承装于后轮轴 2 上。轮胎 25、轮辋 7 用螺栓固定在轮毂 3 上。

侧传动靠传动轴 4 固定在机架上，双联齿轮 17、18 用轴承安装在中间轴上。

动力由变速箱差速半轴上的小齿轮传给双联齿轮 17，再由双联齿轮 18 传给末级大齿轮 24，由它带动后轮毂、轮辋、轮胎旋转，使压路机移动。

轮胎型号：18.00-24-20PR。

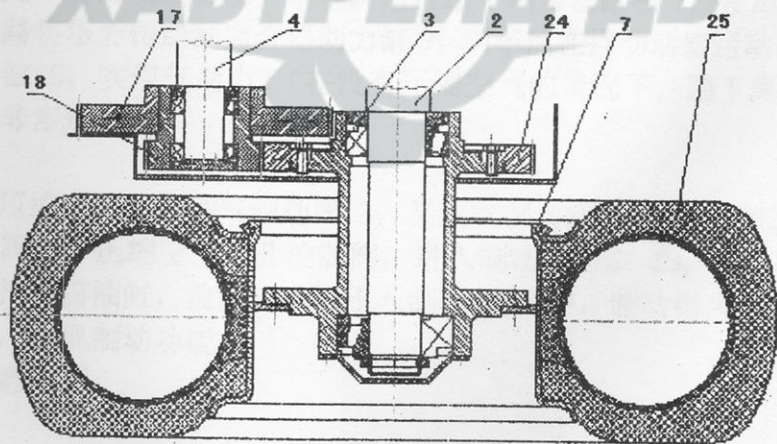


图 8.后轮及侧传动

七、制动装置

制动装置为手刹车及脚刹车两个部分。脚刹车见气路系统（图 10）。

手刹车采用带式制动器，安装于变速箱的倒顺车轴上，它的操纵手柄位于驾驶员座椅的右方，它的功能是保证停车制动，避免发生意外的事故，保证人机安全。

手刹车的结构如图 9 所示。刹车支架 8 固定在变速箱壳体上。刹车带 1 与刹车片 2 铆接成一体安装在刹车支架上。刹车轮 3 借助于花键连接在倒顺车轴上。随倒顺车轴一起旋转。制动时，操纵手把 13 往后拉，通过拉杆 9 拉紧螺丝 4 等有关零件，使刹车带抱紧刹车轮，迫使刹车轮停止转动，使压路机停止转动。在刹止压路机的同时，安装在操纵手把上的棘齿 11 靠弹簧 12 的作用，自动迅速插入齿板 10，迫使刹车带抱紧刹车轮。当驾驶员手离开操纵手柄甚至驾驶员离开压路机时，不使压路机因受外力而自行滚动。

手刹车在分离状态时，刹车片与刹车轮之间保持 1~2mm 间隙。当间隙不合适时，可用安装在拉紧螺丝上的调整螺母 5 进行调整。调整完毕后使调整螺母上的三角形槽卡在轧头凸条上，以防止调整螺母自行松动。当上下刹车片与刹车轮之间间隙不一致时，可用调整螺栓 6 进行调整。调整完毕后拧紧两个螺母 7。

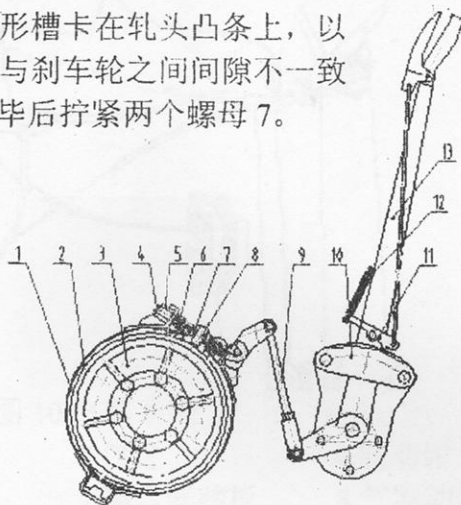


图 9.手刹车

八、气路系统

(见图 10)空气压缩机 1 将压缩空气经调压阀 2 输送到气包 3，在气包内贮存，调压阀将气包内压缩空气压力调定在 800Kpa 左右（出厂时已调好）。压缩空气分两路输出，一路是离合器助力系统；另一路是脚刹车系统。

1. 离合器助力系统

离合器助力系统是一种油气结合助力系统，通过踏下离合器踏板 7，使离合器主缸 6 工作，离合器主缸通过油路将压力传递到离合器助力缸 9，刹车油在推动活塞运动的同时，打开气阀，压缩空气进入助力缸 9，实现气助力。（在没有压缩空气的情况下，踏下离合器踏板，离合器仍能被脱开，但将非常费力。）

2. 脚刹车系统

从气包引出的压缩空气联接到气制动阀 3，又从气制动阀 3 联接到制动加力缸 10，当刹车时，踏下气制动阀 3，压缩空气顶开控制阀，进入制动加力缸 10，从而推动气缸活塞，使气缸内的活塞顶杆推动前油缸，前油缸油被压入制动钳 4 中，制动钳 4 中的两对柱塞油缸被顶出，嵌住制动盘，实现制动功能。

使用调整及注意事项

A、气包

- (1) 车子使用后将放水阀门打开放气，将尘土及水份清除掉。
- (2) 因气包附近有接头较多，应经常检查是否漏气，检查时可用肥皂水检验。B、放气作业（放气作业前，发动柴油机使空压机工作保证气包内气压不低于 60kPa）

油路系统的管子坏了或拆开以后，油路系统进入空气，则必须进行放气。放气时要两人配合，一个人往油筒内加刹车油，同时反复踏动踏板让油路系统充油，另一个进行放气，放气时按下面顺序进行。

(1) 离合器助力系统放气 反复踏动踏板 7 让油路系统充油，同时不断往油杯 6 中加注刹车油，打开离合器助力缸 9 的放气螺塞，踏动踏板放气，然后拧紧放气螺塞。重复以上过程，直到无气泡时为止。

(2) 刹车系统放气 踏动踏板 8 让气路接通，不时往制动加力缸 10 的油杯中加注刹车油，分别将制动钳上的上下放气螺塞轻轻拧开，踏动踏板在油气流出后将此螺塞拧紧，反复操作直到无气泡时为止。

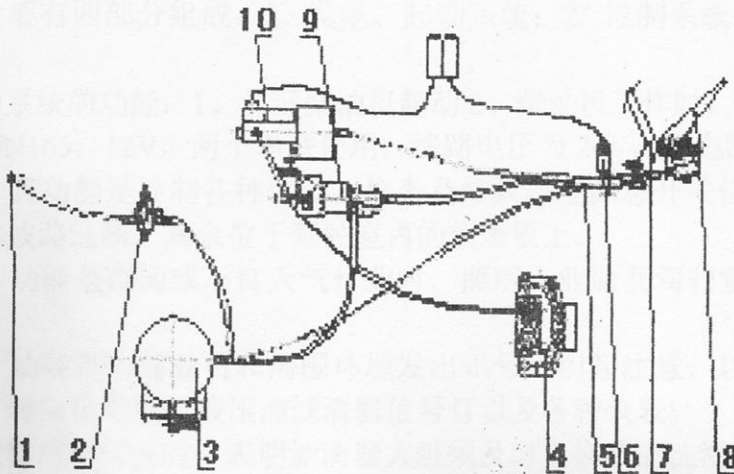


图 10. 气路系统

- | | | | |
|-----------|------------|----------|---------|
| 1. 空气压缩机 | 2. 调压阀 | 3. 气包 | 4. 制动钳 |
| 5. 离合器主缸 | 6. 脚离合油杯 | 7. 离合器踏板 | 8. 气制动阀 |
| 9. 离合器助力缸 | 10. 制动器加力缸 | | |

九、液压系统

液压系统如图 11 所示，它包括液压振动和液压转向两大部分。

液压振动系统由变量柱塞泵、定量柱塞马达组成的闭式油路，马达与振动轮内的偏心块的轴相连，直接带动偏心块旋转，从而使振动轮产生振动。

液压振动系统由变量柱塞泵 1、马达 6、滤清器 2 等部件组成。变量柱塞泵将分动箱输出的机械能转换成液压压力能，然后传到马达，将压力能转换成机械能，带动偏心块旋转。换向靠电磁控制阀换向，因而操作者只需控制选择开关，就能实现压路机的起振、停振。

液压转向系统是由齿轮泵 11、全液压转向器 8、两个互锁的双作用油缸 1、油箱及高压管道等元件组成。系统采用开式系统，转向器与阀块之间是分体设计，实现转向系统安全保护功能，同时对转向油缸受到的由于外部冲击产生的过载提供保护，在低转速下防止由于外载的冲击造成的方向盘的抖动。

两个油缸分别铰接在前、后车架之间，油缸的往复运动可直接推动压路机转向。操作者通过方向盘的控制，可使压路机随动于方向盘左右转向。

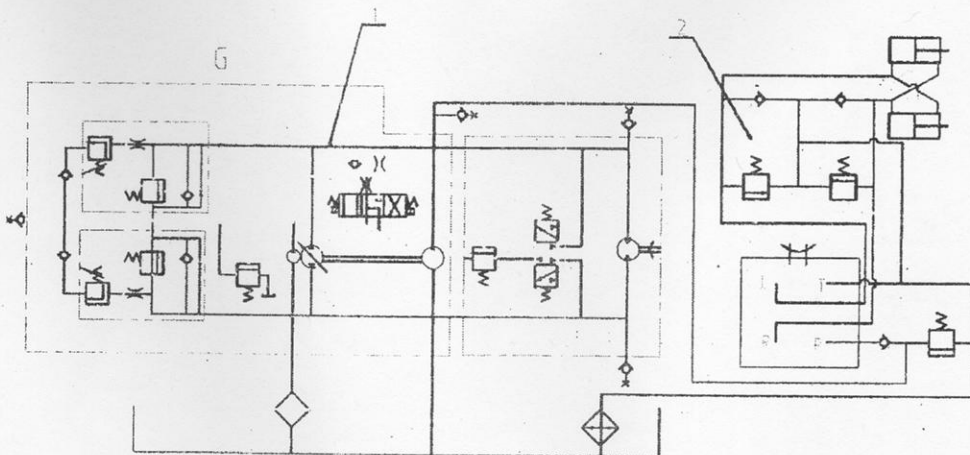


图 11. 液压原理图

十、电气系统

电气系统主要有四部分组成：1. 发电、起动系统；2. 控制系统；3. 照明系统；4. 讯号系统。

发电机起动系统的功能：1、保证柴油机起动 2、柴油机工作时，发动机向蓄电池充电。蓄电池为 DN165，12V，两个串联使用，线路电压为 24V，蓄电池位于压路机尾部。

控制系统：其功能是控制各种仪器，仪表及灯具。电源总开关位于电源负极接地侧，控制整个压路机的线路通断。其余位于驾驶室內的仪表板上。

照明系统。功能是夜间或不良天气作业时，照明作业面及驾驶室，包括前后照明灯和顶灯。

讯号系统。功能是向驾驶员和周围环境发出讯号，引起注意，以免发生人机事故。其主要设备有喇叭、转向讯号灯，液压油滤清器信号灯以及各种仪表。

液压油滤清器信号灯亮时，表明滤清器太脏须及时更换或清洗滤清器的滤芯。

柴油油位表安装在仪表板上，当其指针接近零时，要及时加油。不允许油用完后再加油。

制动气压表指示制动气压，工作前应保证制动气压不底于最低允许值 60kPa，若气压过低应及时检修。否则不允许机器工作。



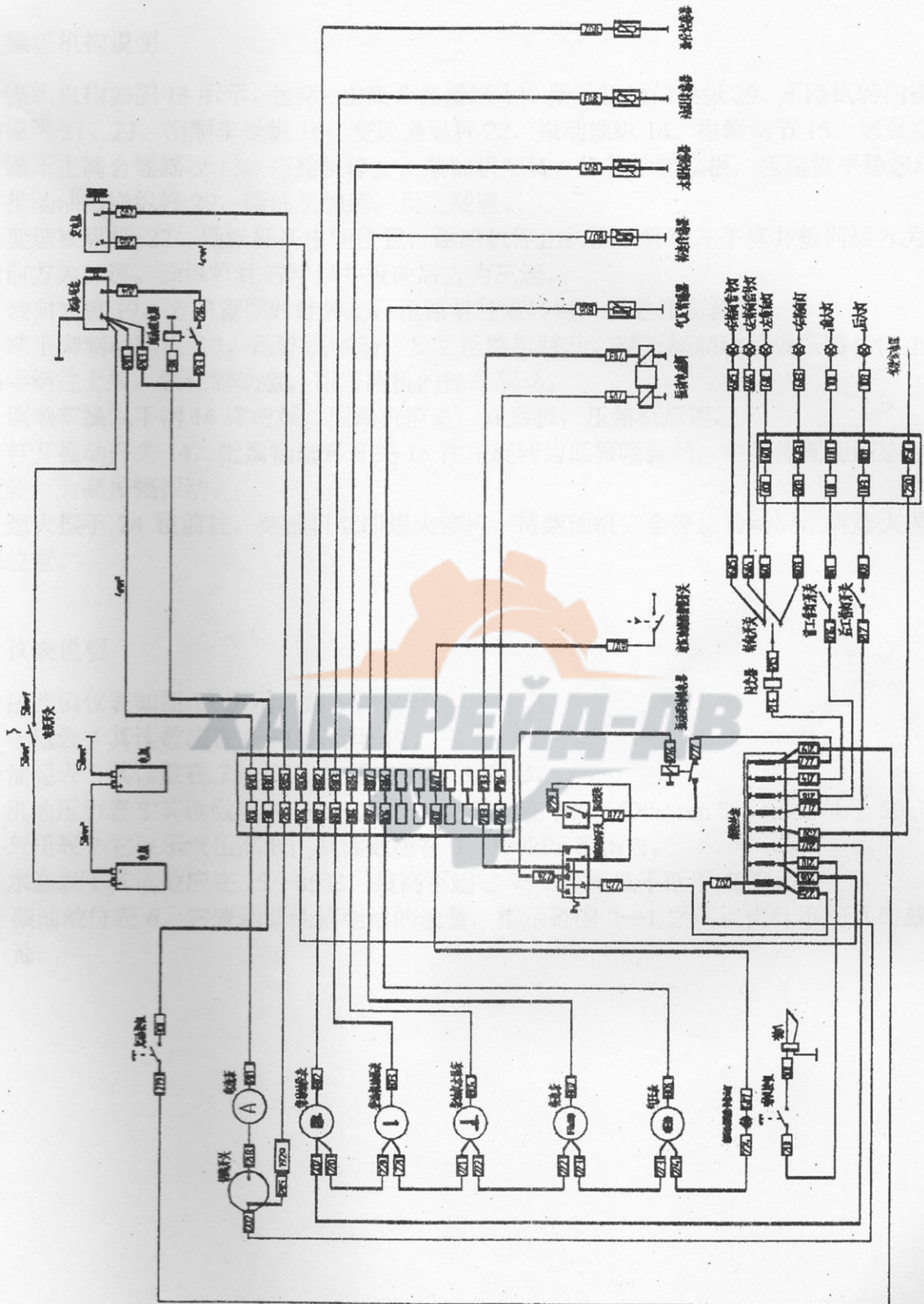


图 12 YZ16JC、YZ18JC 电器系统原理图

第五章 压路机操纵机构和仪表说明

一、操纵机构说明

操纵机构如图 13 所示,包括:主离合器操纵 13、柴油机油门操纵 29、压路机转向操纵 19、制动操纵 21、23、倒顺车操纵 16、变速操纵杆 22、振动操纵 14、振幅调节 15、熄火操纵 24。

踏下主离合器踏板 13,压路机停止,柴油机空转,徐徐抬起踏板,压路机平稳起动。

推动油门操纵杆 29,柴油机加速,反之减速。

变速操纵杆 22,操纵杆在中间位置,压路机停止;操纵杆往左平移并扳向后方为一速,扳向前方为二速。操纵杆往右平移并扳向后方为三速。

转向操纵 19,方向盘顺时针转动,压路机往右转弯;反之往左转弯。

踏下脚制动踏板 23,压路机制动。反之压路机移动。踏下脚制动踏板压路机停止后,手制动手柄往上扳,锁住制动盘,即压路机的停车制动。

倒顺车操纵手柄 16 往前扳,压路机前进;往后扳,压路机后退。

打开振动开关 14,把振幅选择开关 15 往左旋转为低振幅振动;中间位置为停止振动;往右旋转,为高振幅振动。

熄火捏手 24 往前拉,柴油机立即熄火停机,待柴油机完全停止转动后,将熄火捏手推回原来位置。

二、仪表说明

压路机仪表如图 13 所示,共 5 种仪表。

电流表 4 其读数应在 0—13A 范围内。

油温表 5 其读数在 75—85℃,最高不超过 90℃。

机油压力表 3 其读数应在 160—270kPa 之间,在 500—600r/min 时,不得低于 50kPa。

气压表 2 它表示气压高低,其读数应在 0—100kPa 范围内。

水温表 1 其读数应在 75—85℃,最高不超过 95℃,最低不低于 40℃。

柴油油位表 6,它表示柴油箱柴油的油量,指示范围 0—1 之间,指针不到 0 时就得加柴油。

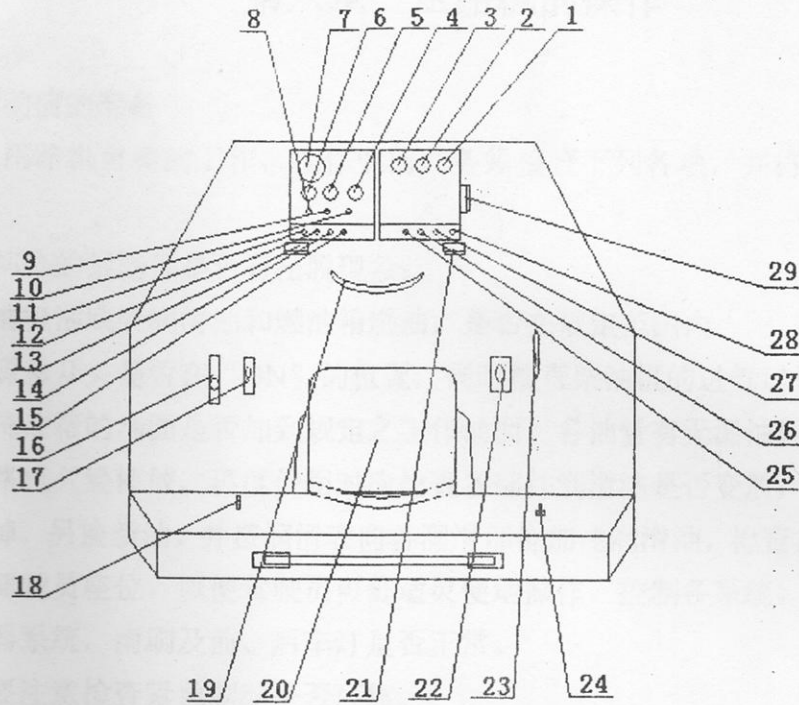


图 13 操纵与仪表布置图

- | | | |
|------------|--------------|-----------|
| 1. 水温表 | 2. 气压表 | 3. 机油压力表 |
| 4. 电流表 | 5. 机油温度表 | 6. 油位表 |
| 7. 转速表 | 8. 机油滤清信号指示灯 | 9. 左转向信号灯 |
| 10. 右转向信号灯 | 11. 钥匙开关 | 12. 点火开关 |
| 13. 主离合器踏板 | 14. 振动开关 | 15. 振幅开关 |
| 16. 倒顺车开关 | 17. 差速开关 | 18. 电源开关 |
| 19. 方向盘 | 20. 座椅 | 21. 脚刹车 |
| 22. 变速手柄 | 23. 手刹车 | 24. 熄火捏手 |
| 25. 前灯开关 | 26. 后灯开关 | 27. 转向灯开关 |
| 28. 喇叭开关 | 29. 手油门 | |

第六章 压路机的操作

一、发动机起动前的准备

为了保证压路机可靠的工作，在作业前，务须检查下列各项，并将检查发现不正常现象给予清除。

- 1.各联接部分的紧固件是否有松脱现象；
- 2.检查柴油机油底壳润滑油和燃油箱燃油，是否在规定范围内；
- 3.检查电源总开关是否在“ON”的位置，同时检查柴油机的进气口是否堵塞；
- 4.液压系统油箱的油面是否加到规定之工作油面，各油管有无漏油现象；
- 5.如果压路机久经停放，再度使用时应检查各部件润滑油是否变质，如果不能再用，应将废油放掉，另换新油，并按润滑表向各润滑部位加注润滑油，检查各管道有无堵塞现象；
- 6.调整好驾驶员座位，以便驾驶员可舒适灵便地操作，控制各系统。
- 7.检查电器系统，雨刷及前、后车灯是否正常。
- 8.开车前要注意检查紧急制动是否可靠。

二、发动机起动

- 1.拉紧手刹车手柄；
- 2.将前进、后退操纵杆必须放在空档位置；
- 3.振动开关必须在中间位置，脱开主离合器；
- 4.按住油门手柄按钮，将油门手柄推至起动（空载）位置（约 800—1000rpm）；
- 5.插入起动钥匙，检查燃油表和电流表，指示正常，然后按动启动开关，发动机应立即起动。若发动机没有起动，待 1min 后重复上述步骤，重新起动，连续起动时间不能超过 10 秒。
- 6.柴油机一开始运转，就平稳减速。使柴油机预热 5—10 分钟，此时驾驶员应观察各仪表读数及柴油机运转情况；
- 7.如在低温下起动请详看柴油机说明书。

三、行走与振动

- 1.拉起油门捏手至最大位置（即柴油机转速为 1800rpm）；
- 2.放松手刹车，踩主离合器踏板，使其与动力切断，然后将变速杆推到所需档位，将换向手柄推至所需方向，松开主离合器踏板，压路机起步；

注意：在选择速度档位时，不允许压路机从停车起步直接用 3 档（即最高速），必须从 1 档或 2 档再换到 3 档；

- 3.检查转向是否灵活；
- 4.打开振动开关，旋转振幅选择开关，压路机即能振动。

注意：不能在坚硬地面上进行振动，以免损坏轴承。

当压路机变换行驶方向时，应先停止振动，不要在原地振动，以免损坏地面；

5.在振动作业时，要随时观察仪表显示读数是否正常。液压油温不得超过 85°C（滤清器上的真空表读数不允许超过 0.03Mpa）。

四、制动

- 1.在平直道路上，当压路机倒顺手柄在中位时，不需踩刹车，压路机就能停车；
- 2.在危险情况下，需要紧急制动时，必须首先踩主离合器切断动力，然后踩脚刹车踏板，使压路机立即停车。

五、停车及停放

- 1.把振动开关、振幅选择开关扳至中间位置，使压路机停振；
- 2.踏主离合器踏板，松开离合器，把倒顺手柄和排档杆均放在空档位置；
- 3.把油门手柄移至空载位置，运转 3—5 分钟；
- 4.拉动柴油机熄火拉杆直至柴油机停止运转；
- 5.把起动钥匙转到“0”位；
- 6.拉起手刹车手柄，使其为制动位置；
- 7.压路机应停放在路边平地上。如需要停放在坡道上时，应用石块或类似的物件挡住驱动轮和振动轮。

六、牵引、起吊及运输

1.牵引

- (1) 牵引时把倒顺杆放在空档位置；
- (2) 把手刹车手柄回复到水平位置，松开手刹车；
- (3) 把牵引绳或杆插入前（或后）牵引钩内；

注意：最大牵引速度 3 公里/小时，最大牵引距离 1 公里。

2.起吊

- (1) 用安全锁紧装置锁住铰接架；
- (2) 安上吊装架，分别挂在前后起吊孔内；

注意：不要挤压压路机任何部位，以免引起变形损坏。

- (3) 起重机械的吊钩、滑轮、铁链、钢丝绳必须安全可靠；
- (4) 在压路机吊装结束后，起动发动机前必须把铰接架的锁紧装置脱开，使它回到原来位置。

3.运输

- (1) 短距离运送压路机时，根据道路情况，压路机可选用 2 档或 3 档自行开去，3 档必须从 2 档转换，不允许从停车起步即开 3 档。
- (2) 远距离运送压路机时，应用平板拖车运输。

注意：在起吊和运输中，应用机身上的锁紧装置将前、后车架锁死，防止发生相对运动，同时压路机应牢靠的固定在平板拖车或火车上。

第七章 压路机保养

七、压路机的清洁和储存

1.压路机的清洁:

压路机每次作业完毕后,必须清洗机器上的污物和灰尘,此时应特别注意柴油机、发电机、起动马达射油泵、喷油器、液压泵和马达,以及液压管路和外表的清洁,必须用干燥、柔软的抹布把这些地方擦净。

压路机如要停放一个较长时间时,必须放出发动机水箱内的水,仔细清洗机器上的污物和灰尘,用煤油擦洗各部件的外表和所有润滑孔并加注一次油脂,对未涂漆的外露部分应涂以黄油或防锈胶。

2.压路机的储存

压路机应储存在干燥的库房内,万一要停放在露天时,停放地面要保持干燥,压路机必须用防雨布盖好。如果压路机储存的时间较长时,应垫起后车架,使轮胎离地。同时顶起前车架使减振块不受压力。每三个月必须起动一次,让压路机低速运转 10—15 分钟。



图 14 保养检查图

- | | | |
|------------------|---------------|--------------|
| 1. 发动机供油泵 | 2. 发动机气门 | 3. 发动机机油油位 |
| 4. 空气滤清器 | 5. 液压油加油口 | 6. 液压油滤清器 |
| 7. 液压油油位计 | 8. 手刹车 | 9. 脚刹车 |
| 10. 振动轮润滑油加油口 | 11. 刮泥板 | 12. 减振块及紧固螺栓 |
| 13. 振动马达 | 14. 振动轮油位塞 | 15. 收铁架 |
| 16. 转向油缸 | 17. 制动器 | 18. 侧传动 |
| 19. 变速箱 | 20. 泵动泵 | 21. 轮胎 |
| 22. 轮胎-空气压力 | 23. 轮胎紧固螺母 | |
| 24. 发动机燃油及润滑油滤清器 | 25. 柴油箱放油塞 | |
| 26. 柴油箱加油口 | 27. 机油或液压油散热器 | |
| 28. 柴油滤清器 | 29. 柴油泵 | 30. 电瓶箱 |
| 31. 离合泵 | | |

第七章 压路机保养

为保证压路机长期具有令人满意的工作性能，用户必须正确地按时保养压路机。

一、压路机保养检查点

压路机保养检查点如图 14 所示。

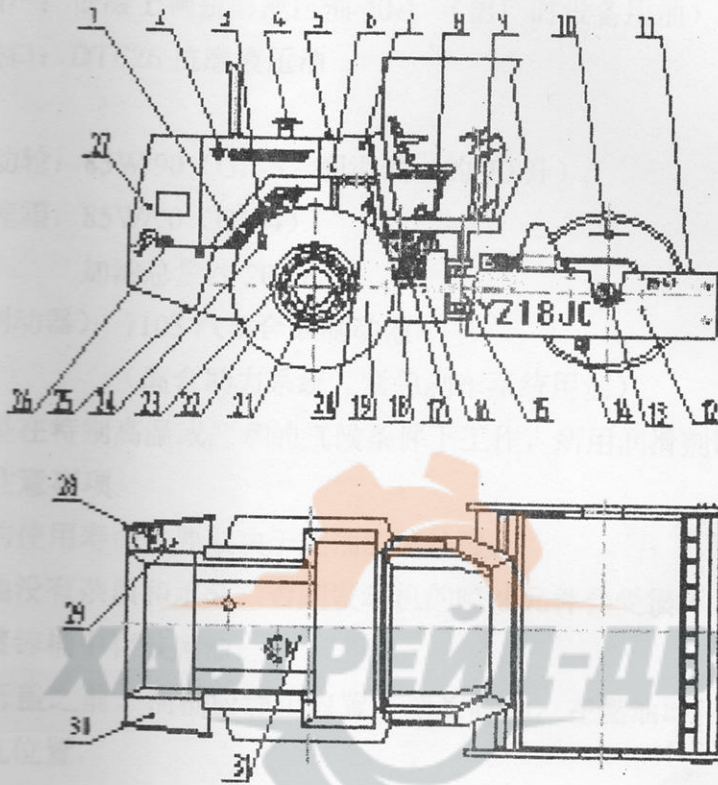


图 14 保养检查图

- | | | |
|------------------|--------------|--------------|
| 1. 发动机供油泵 | 2. 发动机气门 | 3. 发动机机油油位 |
| 4. 空气滤清器 | 5. 液压油加油口 | 6. 液压油滤清器 |
| 7. 液压油油位计 | 8. 手刹车 | 9. 脚刹车 |
| 10. 振动轮润滑油加油口 | 11. 刮泥板 | 12. 减振块及紧固螺栓 |
| 13. 振动马达 | 14. 振动轮油位塞 | 15. 铰接架 |
| 16. 转向油缸 | 17. 制动器 | 18. 侧传动 |
| 19. 变速箱 | 20. 振动泵 | 21. 轮辋 |
| 22. 轮胎-空气压力 | 23. 轮胎紧固螺母 | |
| 24. 发动机燃油及润滑油滤清器 | | 25. 柴油箱放油塞 |
| 26. 柴油箱加油口 | 27. 机油液压油散热器 | |
| 28. 柴油滤清器 | 29. 柴油箱 | 30. 电瓶箱 |
| 31. 离合器 | | |

二、润滑油、液压油的油品及用量

1. 润滑脂：锂基润滑脂。

2. 机 油：柴油机（加油量见柴油机使用保养说明书，约 12 升）
15W/40

3. 液压油：（加油总量约 160 升）

国产：低凝上稠抗磨液压油 40-1 （出厂时设备用油）

进口：DTE26 抗磨液压油

4. 润滑油：

振动轮：85W/90（GL-5）润滑油（约 70 升）

变速箱：85W/90（GL-4）

加油总量约 20 升

5. 刹车油（制动器）：7103 汽车合成制动液

（离合助力系统、紧急刹车系统用油）

如果压路机是在特别高温或严寒的气候条件下工作，所用润滑剂请与我厂联系。

三、燃油系统的注意事项

柴油发动机的使用寿命主要取决于燃油的清洁度。

——保持燃油没有杂质和水分，否则发动机的喷油元件会受损坏。

——不要在镀锌桶中存放燃油。

——在油桶开盖之前，油桶应静止放置一个长时期，在燃油即将吸出之前，决不能滚动油桶寻找塞孔位置。

——不能让吸管搅起油桶底部的沉淀物。

——如果有燃油溅出时，燃油应存放在不会引起危害的地方。

四、 液压系统的注意事项

维修液压系统时，清洁度是极端重要的，要保证没有灰尘或其它杂质进入液压系统，细小颗粒会使元件受损，导致系统无法正常工作，因此要特别注意系统的清洁度。

——如果在日常检查期间发现液压油面已经下降，应检查所有的管路、接头、软管和泄漏元件和液压元件是否泄漏。

——若元件泄漏应立即停机并排除泄漏点。

——液压油桶不能存储在户外，否则至少盖一层保护层，当气候变化时，保证水不能渗入油桶。

——液压油被吸出之前，油桶必须竖起，在放油地点静止放置一段时间，决不能把油桶滚到吸油地点。

——为了防止灰尘进入油中，在吸油之前，要清洗所有零件及工作区域。

——如果可能，用过滤元件给液压系统加油。

——为了防止污物、杂质和水进入油箱，要及时盖好油箱。

五、 保养周期及保养项目

1. 一日保养（每运行 10 小时）

(1) 调节刮泥板

- a. 松开刮泥板的固定螺栓；
- b. 使刮泥板口装在离振动轮 25mm 的地方；
- c. 重新拧紧刮泥板螺栓。

(2) 发动机机油油位检查

- a. 将压路机开到水平地面，然后熄掉发动机；
- b. 取出机油标尺，并检查油位；
- c. 如果量出的油位接近或低于标尺上的油标记，就应加机油，加油量及加油方法如图 15 所示。当油面低于油尺上“L”（低油面）记号或高于“H”（高油面）记号时，决不允许开动柴油机。在柴油机停车后检查油面，至少等 5 分钟后进行，使机油有充分时间流回油底壳。油尺低位至高位的油量差为 3.6L。

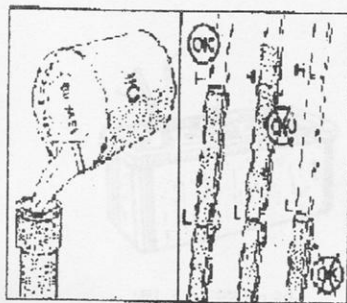


图 15. 加油口及加油量

(3) 液压油油位检查

将压路机开到水平地面，然后观察油标。如果油位低于油标 2cm 以上，就用相同牌号的液压油补足。液压油决不能混用。（图 16）

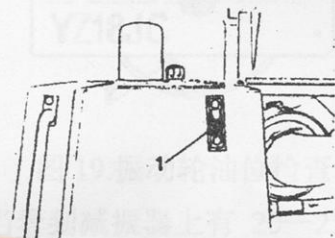


图 16. 液压油箱

(4) 手制动器的调试

使制动器保持良好制动状态，否则应予以调整。

(5) 向柴油箱加柴油

用钥匙打开油箱盖，每天向柴油箱中加柴油，加至柴油油箱的五分之四为止，冬季及时使用冬季柴油，这样不会由于石蜡沉淀而出现稠化。

(6) 制动液油量检查，要随时保证油杯内具有充足的制动液。

2. 一周保养（每运行 50 小时）

(1) 空气滤清器的清洗（图 17）

按其灰尘多少，每运转 10—50 小时清洗一次。松开卡箍 4 并拆下外盖 3，拧开过滤器中部的碟形螺母，并卸下内盖 5，用清洁的布清洗外盖 3。松开碟形螺母拆下主过滤器 6。保证在柴油机工作时灰尘不能透过过滤器，致使灰尘进入发动机进气管，若有连接件软管或其它场元件渗漏，就必须立即更换掉。

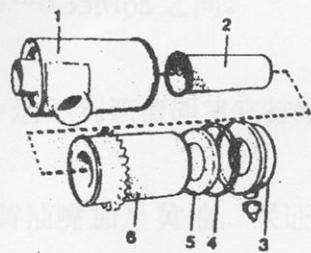


图 17. 空气滤清器

用清洁布揩净过滤器外壳 1 的内表面，并用布清洁进气管。

保证过滤器外壳和发动机之间的连接件以及软管没有损伤，没有渗漏。

(2) 检查所有油管和管接头，以防渗漏。

(3) 检查蓄电池 (图 18)

打开电瓶箱盖，擦净蓄电池顶部，打开各个蓄电池的螺塞 1，检查液面可采用液面检查器 2 进行检验。如果没有检验器，则可用一干净木棒插在格内，直到铅板的上缘，电解液应浸湿木棒约 10—15mm，若液面过低，则加够蒸馏水，如果外界温度低于结冰点，可在加入蒸馏水后，开动柴油机一段时间，否则水会结冰，若发现电池接线柱有腐蚀应及时清除，涂上凡士林。

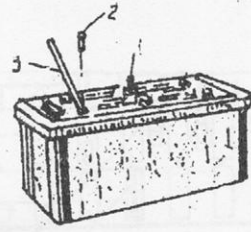


图 18. 蓄电池

特殊要求的压路机采用了免维护进口电瓶，除检查接线柱连接和亏电时及时充电外，其余不需要维护。

(4) 检查振动轮油位

将压路机开到水平路面，以便使螺塞 1 转到最高位置 (图 19) 扭开油位螺塞 2，应有油液流出。

注意：油液过多或过少都会使振动轴过热。

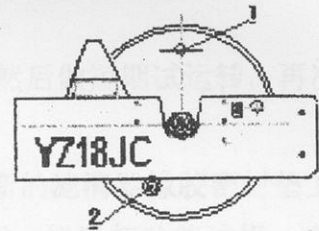


图 19. 振动轮油位检查

(5) 检查减振器

保证橡胶减振器没有任何损坏，且正确拧紧紧固螺栓，当看到减振器上有 20—25mm 深的裂纹时，应及时更换新的橡胶减振器。

(6) 铰接头润滑 (图 20)

铰接处的四个关节轴承分别通过油杯 M10x1 即图示位置 1、2、3、4 打入锂基润滑脂进行润滑。在加完油后让少量黄油留在黄油嘴上，以防灰尘进入。如果黄油不能进入轴承中，就需用千斤顶，减少轴承的负荷后注油。

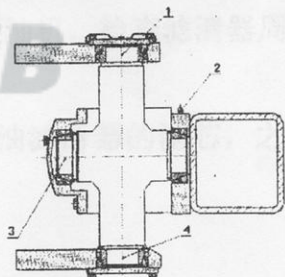


图 20 铰接头润滑

(7) 轮胎气压检查

用轮胎气压表检测左右两轮胎气压，保证轮胎气压在 0.25~0.35Mpa 之间。

(8) 轮胎固定螺母紧固性检查

用扭矩为 500Nm 搬手检测左右轮胎固定螺母的紧固性，达不到该值即将它拧紧。

(9) 转向油缸的安装件润滑

在给铰接头加完黄油后，即可给装在转向油缸左右边的黄油嘴加足黄油，保证黄油必须进入轴承内。

(10) 检查并紧固重要部位的螺栓

振动轮与前车架连接螺栓、铰接架中间的十字轴紧固螺栓、发动机固定螺栓、离合器壳固定螺栓以及泵、马达固定螺栓等是否松动，如松动则立即紧固。

3. 两周保养

到最低位置，卸下螺塞 1，将油放到一个容器中。放尽油后，将压路机开到水平路面上，使螺塞 1 转到最高位置，通过油塞 1 加入新机油，油位螺塞 2 流出油液，油不可过多，亦不可太少。因振动轮采用桶式结构，两侧油室相通，检查单侧油位即可。

图 22.振动轮

(2)柴油机排放

在柴油箱中的水和沉淀物可以通过油箱底部的螺塞排放。放油前，先使压路机停放一段时间（隔一夜），卸下螺塞，放出水 and 沉淀物，直到刚有清洁的柴油流出为止，重新装好排放螺塞。在准备排放前压路机位置最好使其一侧稍高一些，从而沉淀物集中到排放螺塞处。

(3)燃油系中空气排放

如果空气进入燃油系，柴油机将不能正常起动或熄火，所以必须排掉燃油系中的空气。准备排气时先松开螺栓 1（图 23），用手操作供油泵上泵油杆 2，直到不含空气的柴油从螺栓 1 中流出为止，然后拧紧螺栓。在操作手动油泵时，如果没有柴油从螺栓中流出，就用一把 36mm 的固定扳手，放到曲轴螺母上，转动柴油机。

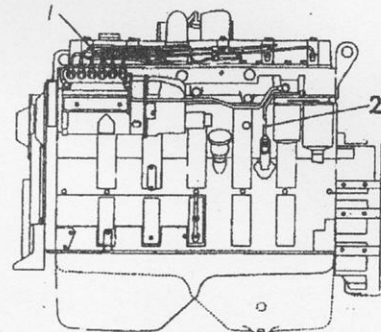


图 23.柴油机喷油泵侧向视图

经拆装的高压管，也要排放管内的空气。松开高压油管连接螺母几圈，油门全部打开，开动起动机，直到不含空气泡的柴油通过连接螺母流出为止，然后拧紧高压油管接头。

(4)更换燃油滤清器(图 24)

清洁燃油滤清器头部周围。拆下滤清器，清洁滤清器头部垫圈表面。更换 O 型密封圈。将干净的柴油注入新的燃油滤清器，并用清洁的机油润滑 O 型密封圈。(图 24)

注意：安装燃油滤清器，在密封圈接触后，再拧紧 1/2 到 3/4 圈即可，过大的拧紧力会使螺纹变形或损坏滤清器密封圈。

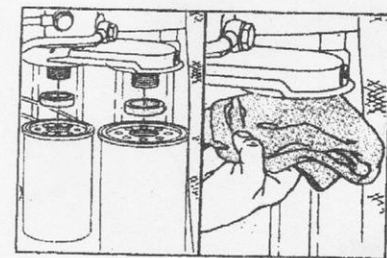


图 24

7.一年保养（每运行 2000 小时）

(1)液压油箱中液压油的更换

在保养液压系统时，要严格保证液压油的牌号、质量、清洁度，这一切对于保证压路机的正常工作和使用寿命，是极其至关重要的。更换液压油最好使用经 10u 滤清器过滤的加油车加油，在更换液压油时应注意下述内容：

- 彻底清洁液压油箱外表，当取下加油口盖时要防止杂质掉入油箱。
- 如果要清洗油箱，必须使用极为干净且不掉毛的刷子或布。
- 由于热油易同杂质混合，且流动性好，因此，应在油热时放油。

d. 国内使用低凝上稠 40-1 抗磨液压油（上海炼油厂），国内未经压路机制造厂同意，不得使用其他牌号油，绝对禁止两种不同牌号液压油混合使用。

e. 清洁液压油箱后，全部密封必须可靠，不允许渗漏油，密封面使用国产 601 密封胶，或使用进口“Loctite”密封剂，以保证良好的密封。

8. 发动机保养 详见《发动机使用保养说明书》

(1) 齿轮齿面磨损过大，尤其是滑动齿轮啮合的啮合齿顶处，更容易引起跳档。发现齿面在长度上不均匀磨损，使齿形形成锥形而产生轴向推力引起跳档时，要及时更换新的齿轮。

(2) 齿轮啮合位置不足，在转位时予以调整。

(3) 变速拨叉轴的自锁机构失效，如自锁钢珠磨研、自锁弹簧太软、拨叉轴及衬套更换零件。

(4) 滚珠轴承严重磨损，使轴不同心也会引起跳档现象，当发现滚珠轴承磨损严重而引起跳档时，应更换新的轴承。

异响

当发动机空转时，如变速箱周围发出声响，要仔细察听，如果发出不正常异响，则必须立即停车检查，发生异响的主要原因是轴承磨损过大，甚至断裂，或者润滑油过少，应及时更换。

漏油

变速箱的漏油部位：变速轴油封磨损、放油塞松动以及油封唇部刃口，避免被异物刮伤损坏。合闸换挡时不要无油换挡。

二、制动器

紧急制动器为液压复合式助力系统用盘式制动器，其主要故障有制动失灵。

制动失灵原因分析

- (1) 油管油路不通或缺油。
- (2) 制动液变质或混进了其它油液。
- (3) 油管破裂漏油或油路上有空气。
- (4) 制动油缸、制动阀等漏油。

三、拨动轮

拨动轮的常见故障为过热和漏油，拨动轮过热会使拨动轴上的轴承烧坏，主要原因有：

(一) 冷却润滑油太少或过量，拨动轮油池里的油不仅润滑轴承，同时也起冷却轴承作用。油太少，轴承得不到良好冷却，结果润滑油膜在高温下破坏，致使轴承烧坏。油太多，在偏心拨子的高速高速冲击下，油变成油雾状态，油雾分子的剧烈碰撞导致温度急剧上升产生过热，导致轴承烧坏。

(二) 轴承的径向间隙调整太小，轴承在工作时，轴与轴套之间有一定的游隙，轴承在高速重载前下工作时，会产生高温使轴承膨胀变形，使径向隙太小，由于热膨胀致使轴承

第八章 故障及其排除

一、变速箱

跳档

变速箱的跳档是指压路机在某一档位行驶时，变速杆自动跳回空档。跳档的主要原因有：

- (1) 齿轮齿面磨损过大，尤其是和滑动齿轮啮合的短齿磨损，更容易引起跳档。发现齿面在长度上不均匀磨损，使齿轮形成锥形而产生轴向推力引起跳档时，要及时更换新的齿轮。
- (2) 齿轮啮合位置不足，在装配时予以调整。
- (3) 变速拨叉轴的自锁机构失效，如自锁钢珠磨损、自锁弹簧太软，发现后及时更换零件。
- (4) 滚珠轴承严重磨损，使轴线不同心也会引起跳档现象，当发现滚珠轴承磨损严重而引起跳档时，应更换新的轴承。

异响：

当发动机空转时，如变速箱周围发出声响，要仔细察听。如果发出不正常异响，则必须立即停车检查，发生异响的主要原因是轴承、齿轮磨损过大，甚至断裂，或者润滑油过少，应及时更换。

漏油：

变速箱的漏油部位可循迹发现，油封的磨损、硬化或失去弹性，与油封配合的变速轴轴径磨损；放油塞松动以及变速箱体裂缝，均将导致漏油。其次，在更换油封时，要注意保护油封唇部刃口，避免被螺纹、台肩损伤。轴插入时不要忘记涂润滑油。

二、制动器

紧急制动器为液压复合式助力系统钳盘式制动器，其主要故障有制动不灵。

制动不灵原因分析

- (1) 油管油路不通或缺油；
- (2) 制动液变质或混进了其它油液；
- (3) 油管破裂漏油或油路上有空气；
- (4) 制动油缸、制动阀内部漏油；

三、振动轮

振动轮的常见故障为过热和漏油。振动轮过热会使振动轴上的轴承烧坏，主要原因有：

(一) **冷却润滑油太少或过量。**振动轮油池里的油不仅润滑轴承，同时也起冷却轴承作用。油太少，轴承得不到良好冷却，结果润滑油膜在高温下破坏，致使轴承烧坏。油太多，在偏心振子的高速高频率冲击下，油变成油雾状态，油雾分子的剧烈碰撞导致温度急剧上升产生过热，导致轴承烧坏。

(二) **轴承的径向或轴向间隙太小，**轴承在工作时，内外圈与滚珠之间有一定的游隙。轴承在高速重负荷下旋转。产生高温使轴承膨胀变形。如果间隙太小，由于热膨胀致使轴承



本身游隙变小而过热烧坏。

因此，加润滑油时一定要根据说明书要求加注。

漏油现象主要是密封失效，紧固螺钉松动所造成的。

其次特别要注意的是如果振动马达轴端密封失效，马达会将液压油向振动轮油池内漏，因此，当发现振动马达轴端密封损坏时，一定要检查振动轮里的油是否混进了液压油，若已混入液压油一定要更换新的润滑油，否则会因两种油的化学变化使油变质而失效。同时会使振动轮温度升高而破坏密封与轴承。

四、液压振动系统

本系统元件（变量泵、马达）所受工作压力较高，因而零件加工、装配等精度都要求较高，在没有一定的试验设备及仪表等条件下，一般不允许用户自行拆开，在没有装压力表的情况下，也不允许自行调整其各部分的压力。

若振动泵没有补油压力，首先检查油位是否正常，然后看补油管路是否通畅，若一切正常则补油泵需要更换。

补油压力不足时，可先考虑更换进油滤芯。

只有一个振幅时，首先检查电磁换向是否到位，若已经到位则检查高压测的压力是多少，压力很低时属于系统内泄或调压阀压力设定小，这时需检查系统中的阀块，压力高又不振时，检查振动轮或花键套的安装情况。

振动频率不够时，可由专业服务人员调节泵的排量，直至达到性能参数为止。

Chapter 1 Preface

YZ16JC、YZ18JC VIBRATORY ROLLER

OPERATION AND MAINTENANCE MANUAL

YZ16JC/YZ18JC vibratory road roller is of self-propelled multi-function road roller, being efficiently used for compacting various kinds of soil layer and stones backfilling and being suitably applied to compacting road surface, airport, port, dam, railway, mine, etc. It has high efficiency and high energy.

The main features of this kind of road roller are of hydraulic vibration, mechanical driving and articulated fully hydraulic steering. Besides these characteristics, the machine also has the feature of big vibration masses and single-frequency with dual-vibration, which can high-efficiently compact various layer with different thicknesses. Hydraulic vibration system adopts a hydraulic system which consists of gear pump and gear motor, so as to ensure the road roller performance as required in its technical data. And mechanical transmission mechanism consists of 3-speed shifting mechanism, steering structure and differential structure, which ensure the flexibility and slope-shifting ability of the road roller. The fully hydraulic steering device can make the control drum be more sensitive.

The machine adopts articulated beam frame, which make it very convenient to carry out maintenance. The operator cab with 3-grade vibrating reduction and noise-insulation device, which provides the operator with more comfortable and safe working environment.

Before you use the road roller, please read this manual carefully, as it helps you understand the performance features, operation & maintenance requirements of the machine, so as to avoid causing troubles due to improper operation and use and to ensure the performance and to prolong the service life of the machine.

The main technical data in this manual are for the customer to understand the machine. On the acceptance basis of the machine, we reserve the rights to modify these data without prior notification.

As regarding to the usage instruction of the diesel engine, refer to the Diesel Engine manual. The YZ16JC/YZ18JC vibratory road roller will only reach the factory performance if you strictly adhere to the regulations outlined in this manual.



XUZHOU CONSTRUCTION MACHINERY SCIENCE&TECHNOLOGY Co., Ltd.
THE PEOPLE'S REPUBLIC OF CHINA

Chapter 1 : Preface

You are welcome to purchase YZ16JC and YZ18JC vibratory road roller manufactured by Xuzhou Construction Machinery Works (see Fig.1).

YZ16JC/YZ18JC vibratory road roller is of self-propelled multi-function road roller, being efficiently used for compacting various kinds of soil layer and stones backfeeding and being suitably applied to the project construction, including: modern highway, airport, backfeeding, seaport, dam, railway, mine etc. whose construction need various compaction depth and high-efficiency.

The main features of this kind of road roller are of hydraulic vibration, mechanical driving and articulated fully hydraulic steering. Besides these characteristics, the machine also has the feature of big vibration masses and single-frequency with dual-vibration, which can high-efficiently compact various layer with different thickness. Hydraulic vibration system adopts open-hydraulic system which consists of gear pump and gear motor, so as to ensure the road roller performance as required in its technical data. And mechanical-transmission mechanism consists of 3-speed shifting mechanism, steering structure and differential structure, which ensure the flexibility and slope-climbing ability of the road roller. The fully hydraulic steering device can make the control drum be more sensitive.

The machine adopts articulated-beam frame, which make it very convenient to carry out maintenance. The operation cab with 3-grade vibrating reduction and noise-insulation device, which provides the operator with more comfortable and safe working environment.

Before you use the road roller, please read this manual carefully, as it helps you understand the performance features, operation & maintenance, repairing etc of the machine, so as to avoid causing troubles due to improper operation and use, and to improve the performance and to prolong the service life of the machine.

The main technical data outlined in this manual only service as the references for the customer to understand the machine's performance specifications, instead of as the machine acceptance basis of the machine, we reserve the rights to modify these specification without giving prior notification.

As regarding to the usage instruction of Diesel Engine, please refer to the Diesel Engine manual. The YZ16JC/YZ18JC vibratory road roller will bring you satisfactory performance if you strictly adhere to the regulations outlined in this manual.

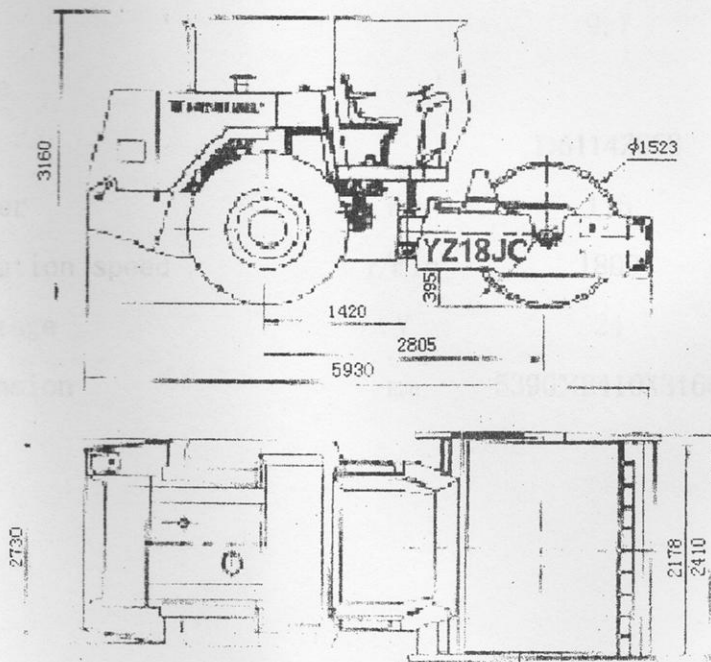


Fig.1 YZ16JC YZ18JC vibratory road roller

Chapter II Technical Data

Product Model	Unit	YZ16JC	YZ18JC
Working Masses	Kg	16000	18000
Masses distributed on vibrating drum	Kg	8300	8500
Masses distribution on driving drum	Kg	7700	9300
Static linear load	N/cm	355	390
Centrifugal	KN	150/300	190/330
Vibration frequency	HZ	28	28
Rated amplitude	mm	2.0/1.0	2.1/1.1
Compacting width	mm	2178	2178
Min. Turning radius	mm	6500	6500
Min clearance to ground surface	mm	395	395
Gradeability		30%	30%
Tyre model		18.00—24	18.00—24
Internal pressure of tyre	kPa	250—350	250—350
Travelling speed	Km/h		
1st speed		2.86	2.86
2nd speed		5.3	5.3
3rd speed		9.7	9.7
Diesel Engine			
Model		D6114ZG5B	D6114ZG5B
Rated power	Kw	115	115
Rated rotation speed	r/min	1800	1800
Starting voltage	V	24	24
Overall dimension	mm	5390X2410X3160	5390X2410X3160

Chapter III Safety Precautions

III.1: General Description

The operator must be trained and competent in road roller prior to Performing operation on the machine.

1. Before driving the road roller, should thoroughly understand all the components, the working performance, the control and operation system of the machine.
2. The machine can be used only on desired road surface. It is prohibited to use vibration system on the high-density material road, eg: cement or asphalt road.
3. When the engine running, don't stand at the articulating joint.

Performing operation on the machine.

Before starting the machine:

1. Before starting the machine, please refer to the operation manual and check the components, including: gearbox, the oil level in hydraulic oil tank and lubricating oil for vibrating drum to see if they can work properly.
2. Don't use the machine in case of any instrument, lamps or control device being in problem.
3. Before starting the engine, all the control devices must be in "Neutral" position.
4. Before driving the machine, the operator should ensure that there is nobody or any obstacle beneath or surrounding the machine.
5. When the engine running, the operator shouldn't leave the machine without attendance..

III.2: Starting the Machine

1. Before starting the machine, check all the instrument, steering ,wheel, braking system, lamps, horn to see if they can work properly. And attention should be paid to check the emergency-stop device.
2. When reversing the machine, be sure that there is nobody or obstacle on the road.
3. Special care should be taken when driving the machine on the sloping road. That is when ascending or coming down from the slope, the machine should be operated to move in straight line and never in bevel angle. And when driving the machine near the slope, the 1st-speed gear should be adopted.
4. When operating the machine on the slope, it is not allowed to extinguish the engine. Otherwise, the hydraulic steering will fail its function.
5. When the machine moving on the slope, if it is a must to shift speed gear or make forward/reverse interchange, then it should be carried out only after the machine being applied stop-braking. When machine coming down the slope, it is prohibited to slide the machine without any speed-gear engaged.
6. It is allowed to use the road roller to transport people.
7. Don't climb the road roller when the machine is travelling.
8. During operating the machine, Attention should be paid to find if there is any unusual noise or smoke arising. When finding the machine being in problem, stop the machine immediately and check it.
9. Only on the smooth and fine road surface can the highest speed gear be applied, and the longest traveling distance covered in such speed should not exceed 30 Km.

III.3: Stopping the Road Roller

1. Before leaving from the machine, be sure to place the control lever in "Neutral" position, and extinguish the engine and applied the hand- brake.
2. If the road roller must be parked on the slope, stop the machine on position where the machine is in perpendicular with the slope surface and place a wedge under the machine.

III.4: Repair & Maintenance

1. When carrying out the repairing & maintenance work on the machine, make sure that the machine being level and stable.
2. When repairing the machine, use a support to protect the articulation joint.
3. When filling the oil tank or checking the sulphuric acid level of battery, it is strictly prohibited to smoke or make spark.
4. When checking the hydraulic system, be sure to check if the system pressure has been declined. And when making repairing work for the hydraulic system, it is the "must" to stop the machine before removing the hydraulic hoses.

III.5: Notes

1. During the machine running, prior to vibration switch being engaged, the throttle of diesel engine must be at its maximum position, i.e: the speed of the engine must be up its rated rotation speed.
2. It is strictly prohibited to apply the vibration function on the high-density material. And it is also not allowed to apply the high-amplitude compaction when the material density being more then 90% and the machine being stationary.
3. This type of road roller is only suitably used for compacting base and sub-base foundation, not for compacting road surface.
4. If the machine working on the quite loose soil or when one drum (or two drums) getting stuck in mud, then lock the differential mechanism. And when working on the normal condition, the machine will be in differential mode. However, if the differential mechanism is locked for too long time, the side transmission will possibly be damaged when making steering.

Chapter IV Description of Main Structure

IV.1 General description

YZ16JC/YZ18JC self-propelled heavy vibration roller can be used for compacting airport, mining and other large scale engineering works.

The vibratory frequency of YZ16JC/YZ18JC roller is 28Hz, two amplitudes. It is especially used in compacting base course and embankment.

The machine is composed of main component of articulated frame, driving drum, vibrating drum, power mechanism and transmission mechanism, Side-transmission, hydraulic vibration, hydraulic steering, control mechanism and electric system etc. Vibrating drum is mounted on front articulated frame. It has two amplitudes and one frequency. The amplitude is selected according to different compacting material. The shock absorber is mounted between vibrating drum and frame to prevent the vibration to the frame.

Driving drum is two pneumatic tyre which are mounted on the two sides of the frame and prevent the vibration beyond the surface transmitted to the frame. The power is transmitted from differential shaft to driving drum by the two sides of transmission.

Power system adopts D6114ZG5B diesel engine, mounted on rear of the frame. The shock absorber is mounted between diesel engine and the frame to prevent the vibration transmitted to the frame. The power of diesel engine is transmitted to two ends. One transmitted to the gear box, the other transmitted to hydraulic pump.

Transmission mechanism is located in the middle of the rear frame. It consists of three speed shifting mechanism, forward/reverse mechanism and differential mechanism through which 3 speed shifts forward and backward of compaction and different between the two driving wheels when turning are obtained.

Operation platform and cab are mounted on front part of rear frame. The shock absorbers are all mounted between platform and frame, between operator's seat and platform to prevent the vibration of the frame transmitted to operator.

Measuring pressure point is fixed on hydraulic system, it is easy to control and adjust the pressure of the system. Adopts fully hydraulic steering, which makes the steering control be easy.

Illumination device is provided in electric system, it is easy for working at night or in foggy weather, also provided trouble-alarms in order to remedying the trouble to prolong the service life of the machine.

Frame is articulated- beam type structure, easy for maintenance and repair work.

IV.2 Transmission System

The transmission system of road roller is shown as Fig.2. The power of the diesel engine is transmitted by fly-wheel and crank pulley.

The power of diesel engine 1 transmitted to input shaft gear 3 through clutch 2, there by actuating gear 23 and making shift shaft 20 to rotate together with the three gear 19, 21 and 22 fixed on it, separately again through sliding gear 4, 6 and 7 being in mesh with 19, 21 and 22 on transmission shaft 20, making it possible to obtain three different speeds of transmission shaft 5 and three different working speed of road roller. i.e. gear 7 meshed with gear 19, first speed is obtained, engagement of gear 6 and gear 21 gives second speed and engagement of gear 4 and gear 22 gives third speed.

Bevel pinion 8 which is fixed at the end of the transmission shaft 5 is constant mesh with the two bevel gear 10. the rotation of bevel pinion will drive the two bevel gears to run in opposite directions.

Reversing gear 16 can slide towards left or right and comes to mesh with the internal teeth of either the two opposite direction and driving the roller forward or backward.

Reversing gear 16 is in constant mesh with differential gear 13 and drives differential shell. The power derived from the left 11 and right 14 half shaft are transmitted separately through transmission gear 15, 17, 18 and 24 at the two side to drive the two tyres making if possible to obtain the operation speed of road roller.

The power of diesel engine 1 is transmitted to input shaft 29 of divider through universal coupling 31 to run the gear 27 through static gear fixed on input shaft 29 so rotating the input shaft 28, thereby actuating duplex gear pump 26 to rotate it makes the road roller to steer and vibrate.

Table I List of Transmission Gear

No. in fig	Name of gear	Q'ty	No. of teeth
3	gear shaft	1	17
4	3 rd shifting gear	1	28
6	2 nd shifting gear	1	37
7	1 st shifting gear	1	45
8	Bevel pinion	1	23
9	Reverse internal gear	2	15
10	Bevel gear	2	27
13	Big gear	1	54
15	pinion	2	24
16	Reverse gear	1	15
17	Side transmission gear	2	52
18	Side transmission pinion	2	24
19	Shifting shaft gear	1	15
21	2 nd speed gear	1	23
22	3 rd speed gear	1	32
23	Shifting gear	1	43
24	gear	1	56
27	pinion	1	31
30	Big gear	1	37
Fig.5 3	Differential bevel gear	2	30
Fig.5 2	Differential bevel pinion	2	15
Fig.5 10	Differential interlock internal gear	1	36
Fig.5 9	Differential interlock gear	1	36

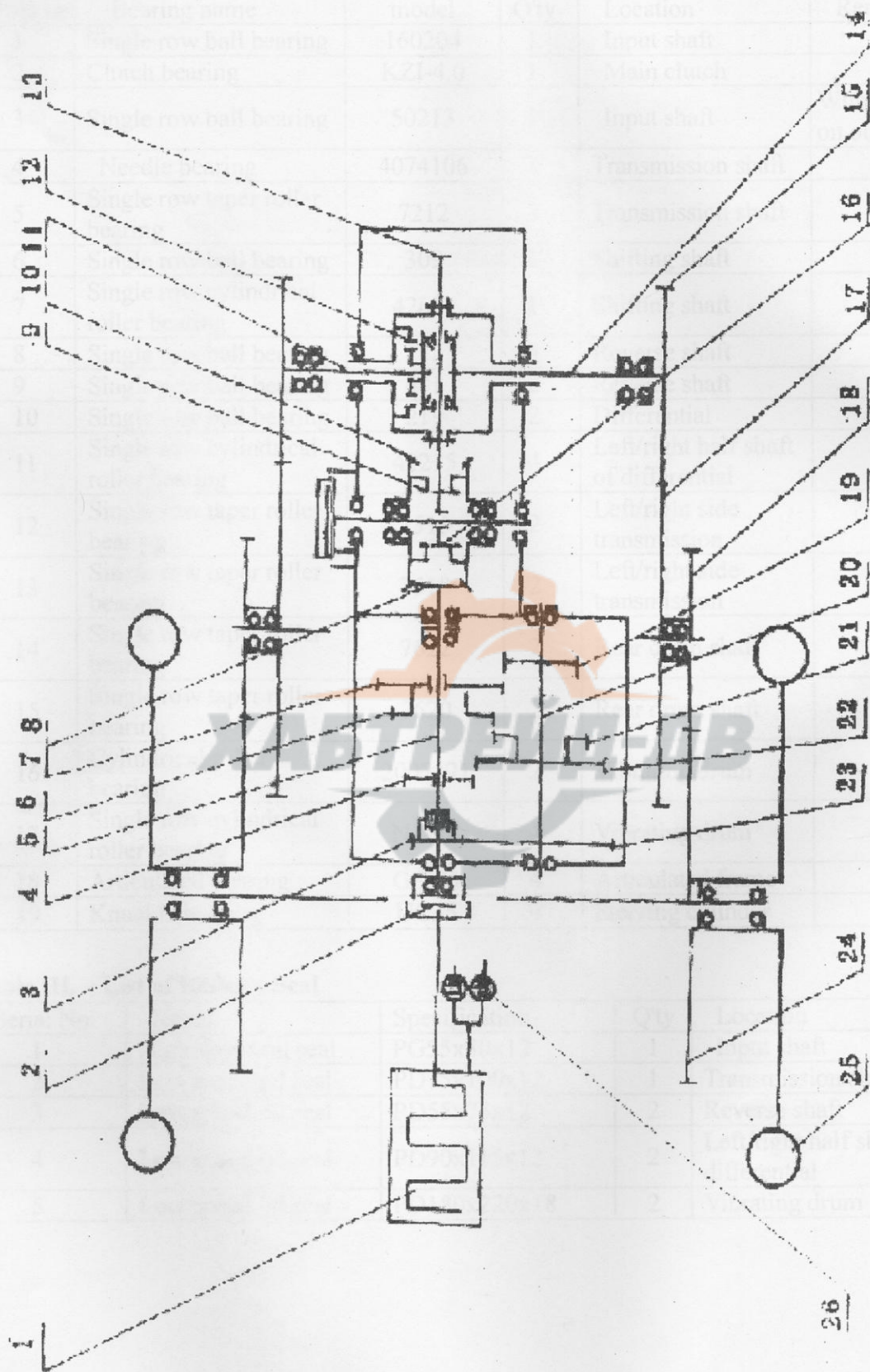


Fig.2 Transmission System

Table II List of Roller's Bearing

Serial no	Bearing name	model	Q'ty	Location	Remarks
1	Single row ball bearing	160204	1	Input shaft	
2	Clutch bearing	KZI-4.0	1	Main clutch	
3	Single row ball bearing	50213	1	Input shaft	With thrust slot on outer ring
4	Needle bearing	4074106	1	Transmission shaft	
5	Single row taper roller bearing	7212	2	Transmission shaft	
6	Single row ball bearing	309	1	Shifting shaft	
7	Single row cylindrical roller bearing	42611	1	Shifting shaft	
8	Single row ball bearing	212	4	Reverse shaft	
9	Single row ball bearing	411	2	Reverse shaft	
10	Single row ball bearing	219	2	Differential	
11	Single row cylindrical roller bearing	42215	4	Left/right half shaft of differential	
12	Single row taper roller bearing	7516	2	Left/right side transmission	
13	Single row taper roller bearing	7518	2	Left/right side transmission	
14	Single row taper roller bearing	7622	2	Rear drum shaft	
15	Single row taper roller bearing	7620	2	Rear drum shaft	
16	Cylindrical roller bearing	2007121	2	Vibrating drum	
17	Single row cylindrical roller bearing	NJ324	4	Vibrating drum	
18	Articulated bearing	GS-85	4	Articulated frame	
19	Knuckle bearing	UC35	4	Steering cylinder	

Table III. List of Roller's Seal

Serial No.	Name	Specification	Q'ty	Location
1	High speed oil seal	PG55x80x12	1	Input shaft
2	Low speed oil seal	PD75x100x12	1	Transmission shaft
3	Low speed oil seal	PD55x75x12	2	Reverse shaft
4	Low speed oil seal	PD90x115x12	2	Left/right half shaft of differential
5	Low speed oil seal	PD180x220x18	2	Vibrating drum

IV.3. Gear Box Assembly

Gear box used for transmitting power, is the main component part of the transmission system. It has three functions, namely changing speed, reversing direction and differential.

Fig. 3 shows gear shift mechanism, which is located at the front part inside the gear box. Shaft 3 is of power input gear shaft. Shaft 5 is of transmission shaft. On the transmission shaft are mounted with movable shift gear 1st and 2nd (gear 7,6) and 3rd speed (gear 4). Shaft 20 is of shifting shaft, which is fixed with driven gear 23 and driving gear 19, 21 and 22. Each shaft is supported by needle bearing, ball bearing, roller bearing and taper bearing. At the rear end of transmission shaft is fixed bevel pinion 8 which is in mesh with two bevel gears of the reverse mechanism.

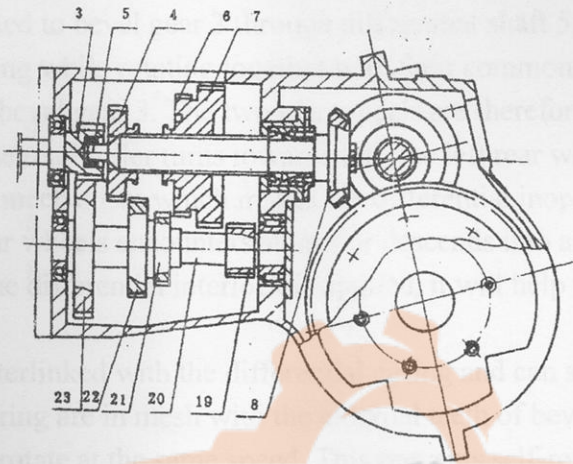


Fig. 3 Gear shift mechanism

Fig. 4 shows reverse mechanism which is at the middle part inside the gear box. Bevel pinion 8 is in mesh with two bevel gears 10 at the rear end of transmission shaft. The two bevel gears rotate in opposite directions on the reversing shaft 3. When engaged with the internal gear of either of the bevel gears, gear 16 will turn in either of the opposite directions, thereby effecting changes of moving direction of the roller. Gear 16 is in mesh with differential gear 13.

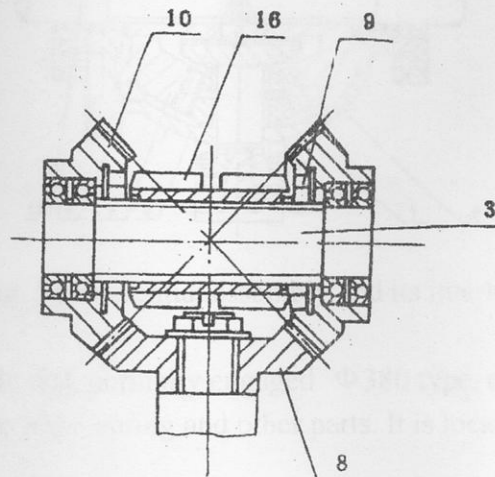


Fig. 4 Reverse Mechanism

Fig. 5 shows differential assembly and its interlocks. They installed at the rear part inside the gear box casing.

The function of the differential is to allow the two rear rolls to run at different speed when the road is making a turn so as to ensure smooth turning and prevent impair of road surface by towing. The differential is of bevel gear type. Wheel gear 13 and two differential half casing 4 and 8 are fixed together. Bevel pinion 2 and 7 are mounted on a common seat 6 which is fitted on the differential casing and rotates together with it. Bevel gear 3 and 9 are keyed to differential shafts 5 and 11 by spline. The power is transmitted from the reversing gear to wheel gear 13 actuating the differential casing and the gear seats to rotate together. The two bevel pinions while rotating commonly with their seats. Drive bevel gear 3 and 9 to turn in same direction thereby making the road roller to move forward or backward along a straight direction. When the road roller is making a right turn, the resisting force exerted on the right wheel is comparatively greater than that on the left wheel. The resisting force is transmitted to bevel gear 3 through differential shaft 5. At this instant, bevel pinions 2 and 7 effect self-revolving while rotating together with their common seat, this results that bevel gear 9 turns quicker than bevel gear 3. The two rear wheels are therefore running at two different speeds similarly. When the road roller turns towards left, the left rear wheel will turn slower. Differential interlock is a mechanism which makes the differential inoperative. In operation, it may happen that one of the rear wheels encounters stones or descends into a muddy pit making the wheel to slide. By this time, if the differential interlock is applied, it will help the road roller to run over the embarrassment.

Internal gear ring 10 is interlinked with the differential casing and can slip around it, when the internal teeth of the slipping gear ring are in mesh with the external teeth of bevel gear 9, the gear 9 and casing 8 are joined together and rotate at the same speed. This prevents self-revolving of pinions 2 and 7 and makes bevel gears 9 and 3 to rotate at a same speed thereby the differential becomes inoperative.

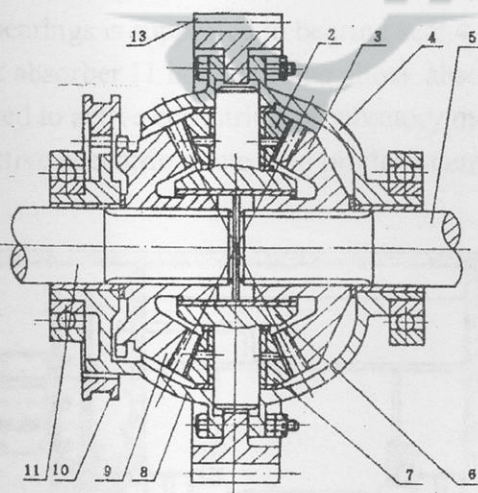


Fig. 5 Differential assembly and its interlocks

IV 4: Main clutch

The main clutch is of dry single disk normally engaged $\Phi 380$ type, composed of clutch housing, driven plate assembly, pressure plate, spring and other parts. It is located between engine and gear box, with the functions as follows:

- (1) To connect the engine and gear box.
- (2) To transmit power of the engine.
- (3) To minimise impact of gearing parts in case of collision of operation.

As shown in Fig. 6, the pressure is screwed on the end surface of flywheel, by action of spring, the

driven plate is kept tight on the end surface of flywheel, rotating with the flywheel. The engine power is transmitted to input shaft and then to gear box by spline. When de-clutching, let declutch sleeve slide to press on lever so as to overcome the pressure of spring, making driven plate separated from the end face of flywheel, diesel engine runs idle.

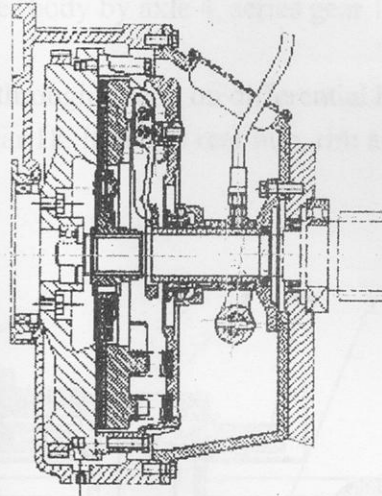


Fig. 6 Main clutch

IV5: Vibratory Drum

Vibratory drum is mainly used for producing centrifugal force and compacting. Its construction is shown in Fig. 7. Two active eccentrics are mounted in bearing seats 8 and 10 by two roller bearings, bearing seat and wheel body 6 fixed together. Two active eccentrics connected by transmission shaft 7, bearing seat 10 by two taper bearings is supported to bearing seat 4 connected to rubber shock absorber 2. The plate of shock absorber 11 bolted rubber shock absorber 2 and frame. Transmission sleeve 3 used spine is connected to active eccentric and vibratory motor fixed on face cover 1. Transmission power makes active eccentric rotate then produce centrifugal force.

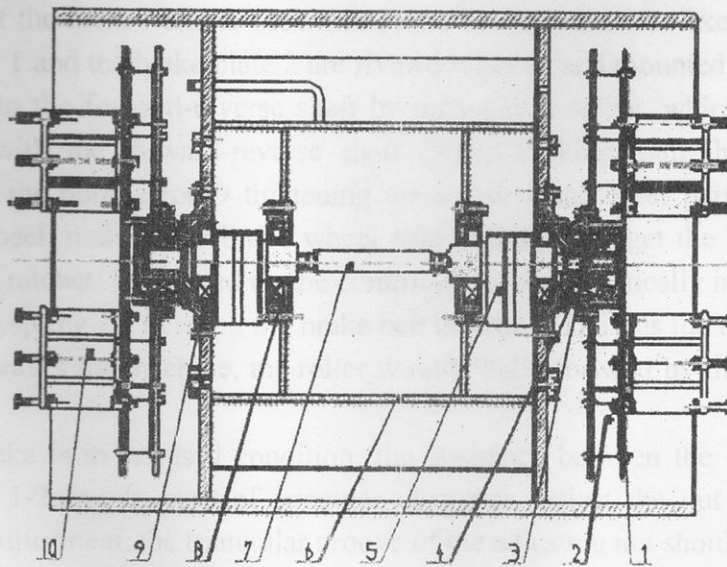


Fig. 7 Vibratory Drum

IV 6: Rear Drum and Side Transmission

The rear drums are two driving rollers located at the left and right side at rear part of the roller body. Construction of the rear drums is shown in Fig. 8. It is fixed to the roller body by rear axle 2, rear hub 3 is mounted to rear axle 2 by anti-friction bearing. Tyre 25 and rim 7 are fixed to rear hub 3 with bolt. Slide transmission is connected to roller body by axle 4, series gear 17 and 18 are mounted to medium axle by bearings.

Power is transmitted to series gear 17 through pinion on differential half-shaft of gear box, thereafter transmitted to end gear 24 by series gear 18. It makes rear hub, rim and tyre rotate, road roller move. Tyre: 18.00-24

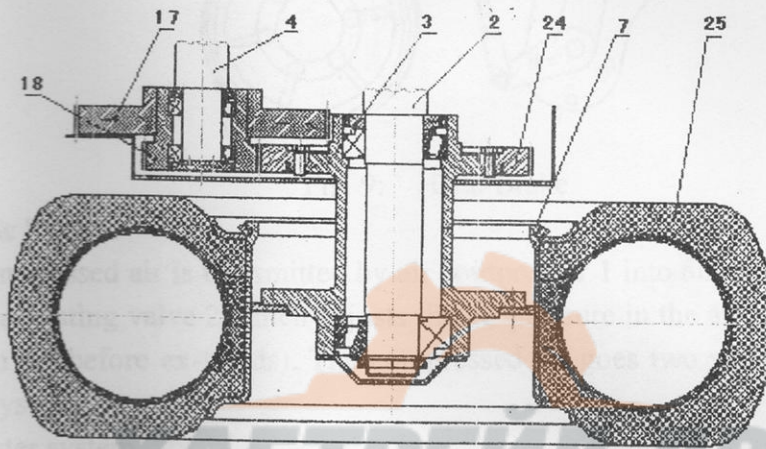


Fig. 8: Rear Drum and Side Transmission

IV. 7: Braking Mechanism

The braking equipment consists of two systems of foot brake and hand brake. Foot brake(see Air Pressure system).

The hand brake is a two-end belt brake type, which is mounted on the forward-reverse shaft of the gear box. The control lever is on the right of the operator's seat, the function of which is to stop the roller abruptly to avoid accident, therefore ensure the safety of person and machine.

The construction of the hand brake is shown in Fig.9. The bracket 8 is fixed to the case of the gear box. The brake belt 1 and the brake plate 2 are riveted together and mounted on the bracket. The brake wheel 3 is fixed to the forward-reverse shaft by means of a spline, which enables the brake wheel rotate together with the forward-reverse shaft. When braking, pull the control lever 13 backward, thus through the pulling rod 9 tightening the screw 4 and other parts, the brake belt is pressed on the brake wheel, making the brake wheel stop rotating, and get the braking of the road roller. In the meanwhile, ratchet 11 mounted on the control lever is automatically inserted into the gear plate 10 by means of the spring 12, keeping the brake belt in action. Thus, as the operator releases the control handle or even leaves the machine, the roller wouldn't slip forward by the action of external force.

When the hand brake is in released condition, the clearance between the brake plate and the brake wheel should be 1-2mm. In case of irregular clearance, adjust the nut 5 mounted on the tightening screw. After adjustment, the triangular groove of the adjusting nut should be clamped at the convex bar to avoid the nut from loosening. When the clearance between the upper and lower brake plates and the brake wheel are not the same, adjust them by the adjusting bolts 6. after adjusting, tighten the two nuts 7.

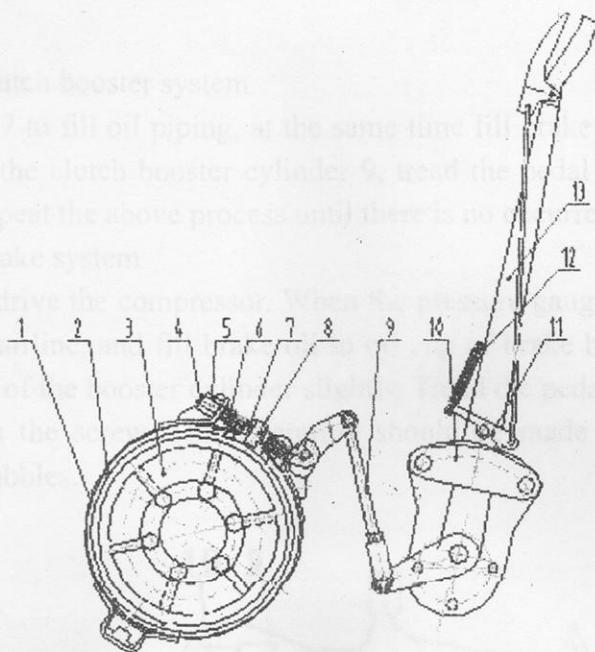


Fig. 9: Hand Brake

IV. 8: Pneumatic System

(See Fig.10) Compressed air is transmitted by air compressor 1 into air reservoir 3 and stored there via air pressure adjusting valve 2 which adjusts the air pressure in the air reservoir at about 800kpa (which has been set before ex-words). The compressed air goes two ways: clutch booster system and foot brake system.

1. Clutch booster system

The clutch booster system is a kind of boost system combined with oil and air. Step down the clutch pedal 7 to operate the main cylinder of clutch 6, which transmits pressure to booster cylinder 9 by oil line. The hydraulic oil propels piston and meanwhile opens air valve. The compressed air goes into booster cylinder 9, thus makes clutch work easily.(Although the clutch can also be disengaged when step down the pedal, but it takes effort.)

2. Foot brake system

The compressed air from the air reservoir is connected to the air brake valve 8 and to the brake booster cylinder 10. when braking, the brake pedal is stepped on to turn the control valve, allowing the compressed air to enter the booster cylinder. As a result the piston of the cylinder is pushed forward and the front oil cylinders is compressed in the brake clip 4, in which two pairs of piston cylinders are pushed out, clamping the brake puck and the braking is realized.

Operation and adjustment

A. Air reservoir

- (1). After running, the air exhaust valve of the roller should be opened to expel dirt and moisture.
- (2). As there are many connectors around the air reservoir, it is necessary to make regular inspection for air leakage. Inspection can be carried out with soapy water.

B. Air bleeding (Before bleeding air, start the engine to allow the air compressor working, so as to ensure the pressure in air conservator not less than 60kPa.)

Air may enters the pipes of the oil pressure system if the pipes are worn out or dismantled. In this case, air should be expelled.

During expelling two persons are required: one for injecting braking oil to the drum and treading on the pedal to fill oil to oil piping and the other for expelling air in accordance with the following

order:

(1). Air expelling of clutch booster system

Tread on the pedal 7 to fill oil piping, at the same time fill brake oil to oil cup 6, unscrew the expelling screw of the clutch booster cylinder 9, tread the pedal to expel air, then tighten air expelling screw. Repeat the above process until there is no occurrence of bubbles.

(2). Air expelling of brake system

Start the engine to drive the compressor. When the pressure gauge shows above 600kpa, tread pedal 8 to connect airline, and fill brake oil to oil cup of brake booster cylinder 10. Unscrew the expelling screw of the booster cylinder slightly. Tread the pedal and in the course of oil and air flowing, tighten the screw. This operation should be made repeatedly until there is no occurrence of air bubbles.

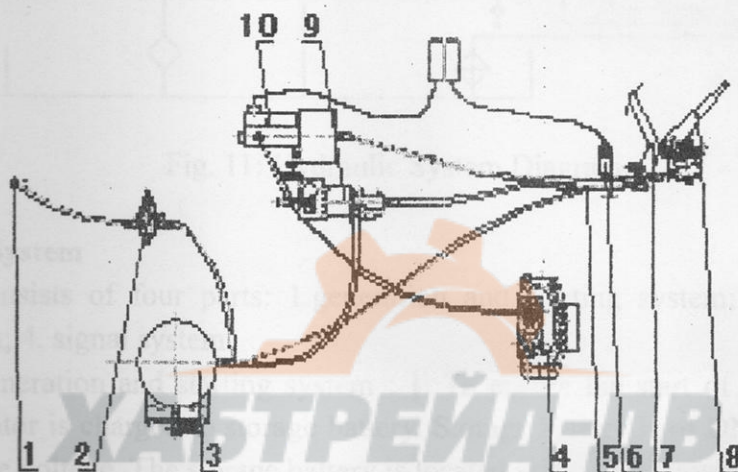


Fig. 10: Pneumatic System

- | | | |
|---|------------------------------|------------------------------|
| 1. Air compressor | 2. Adjusting valve | 3. Air reservoir |
| 4. Braking clamp Clutch's main cylinder | 6. Oil pan for foot clutch | 7. Clutch pedal |
| 8. Air braking valve | 9. Clutch's booster cylinder | 10. Braking booster cylinder |

IV.9: Hydraulic System

The hydraulic system (See Fig.11) consists of hydraulic vibration and steering.

The vibration system is a closed-type oil circuit, composed of variable piston pump and fixed piston motor. Connected with the shaft of eccentric block, the motor drives the eccentric block and makes the vibration of the vibratory drum.

Hydraulic vibrating system is composed of imported piston pump 1, piston motor 6, vibrating valve 5, speed adjusting valve 3, control valve 9 and hydraulic filter 2, etc. The mechanical energy from power divider is changed into hydraulic energy by piston. Then the energy is changed into mechanical energy by piston motor to rotate the eccentric block. Direction changing is realized by electromagnetic control valve. Therefore the operator only needs to control the amplitude switch to choose start/stop as well as high/low vibration.

Hydraulic steering system is composed of gear pump 11, all-hydraulic steering gear 8, two interaction feed back cylinders 1, oil tank and high-pressure pipe lines etc. The system is of open system, with steering gear and valves block being in separate designing structure, so as to protect the steering system and also protect the steering cylinder from being overloaded by external force or shock and the steering wheel from being vibrated by external force or load at low rotation speed.

The two cylinders are mounted at the two sides of articulated brackets. The reciprocating movement of cylinders directly makes the roller steer. The operator controls the steering wheel, and the roller turns direction consequently.

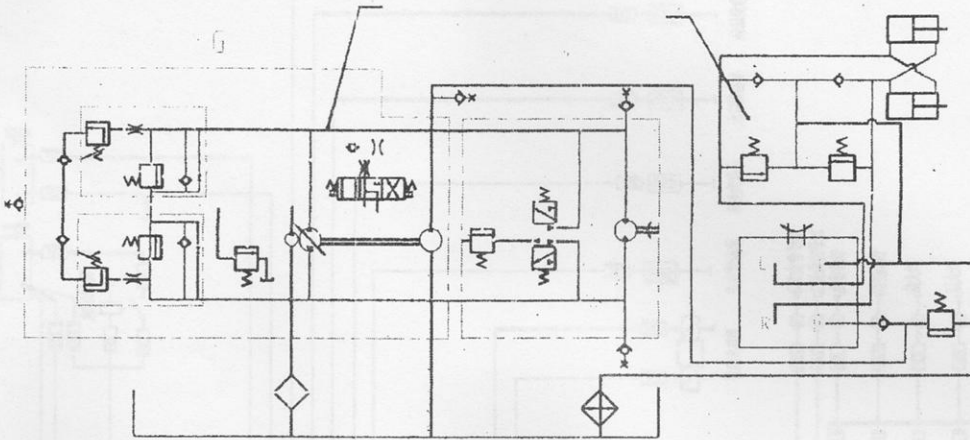


Fig. 11: Hydraulic System Diagram

IV. 11: Electric System

Electric system consists of four parts: 1. generation and starting system; 2. control system; 3. illumination system; 4. signal system.

The function of generation and starting system : 1. To ensure the start of diesel; 2. When diesel engine runs, generator is charged to storage battery. Storage battery is of DN165, 12V, with two in series and 24 V wire voltage. The storage battery is located at the right side of roller end.

The function of control system: To control various apparatus, instruments and illuminators. Power switch, located at the grounding side of the negative pole, controls the whole electric wire of roller. Others are located at instrument panel.

The function of illumination system: To illuminate the working area and the operator's platform at night or in bad weather. It is composed of headlamp, rear lamps and top lamp.

The function of signal system: To send signals to operator or environment, causing attention. It avoids the damage of operator and roller. It is composed of electric horn, steering signal lamp, and pilot lamp of hydraulic oil filter and instruments.

The pilot lamp of hydraulic oil filter lights if the filter is too dirty. At this time the filter element should be cleaned or replaced.

Diesel oil-level indicator is mounted at instrument panel. When it is approaching to zero, which means it needs to refill oil. It isn't allowed to refill oil when the oil is used up.

Air pressure for braking is indicated in air pressure meter and should be kept above the minimum value before operation. If the pressure is too low, the roller cannot be operated.

Fig. 12: Electrical System Diagram of YZ18JC

Chapter V : Control Mechanism And Instrument Description

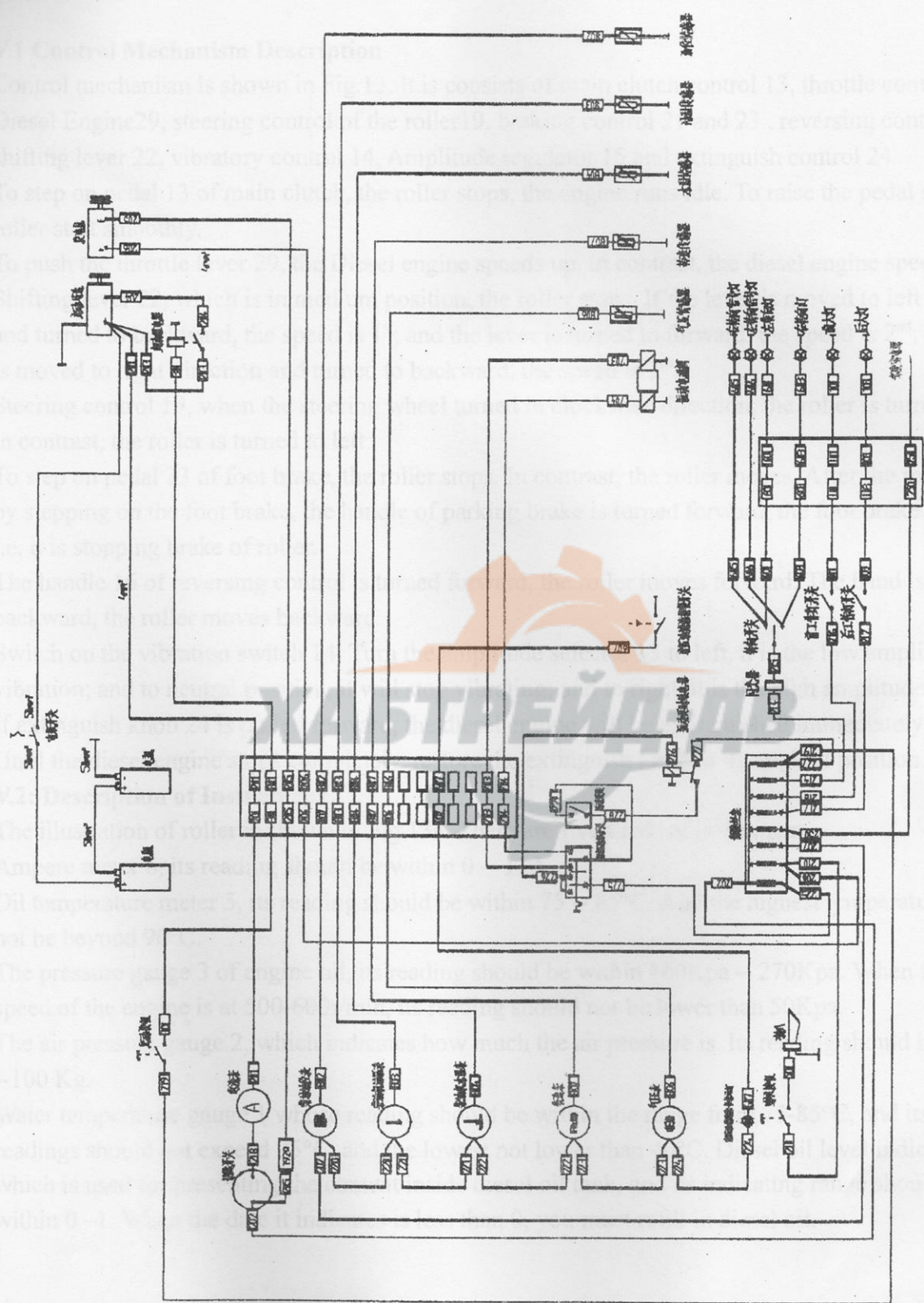


Fig.12: Electrical System Diagram of YZ18JC

Chapter V : Control Mechanism And Instrument Description

V.1 Control Mechanism Description

Control mechanism is shown in Fig.13. It consists of main clutch control 13, throttle control of the Diesel Engine 29, steering control of the roller 19, braking control 21 and 23, reversing control 16, shifting lever 22, vibratory control 14, Amplitude regulator 15 and extinguish control 24.

To step on pedal 13 of main clutch, the roller stops, the engine runs idle. To raise the pedal slowly, the roller starts smoothly.

To push the throttle lever 29, the Diesel engine speeds up, in contrast, the diesel engine speeds down. Shifting lever 22, which is in medium position, the roller stops. If the lever is moved to left direction and turned to backward, the speed is 1st; and the lever is turned to forward, the speed is 2nd; and lever is moved to right direction and turned to backward, the speed is 3rd.

Steering control 19, when the steering wheel turned in clockwise direction, the roller is turned to right, in contrast, the roller is turned to left.

To step on pedal 23 of foot brake, the roller stops. In contrast, the roller moves. After the roller stops by stepping on the foot brake, the handle of parking brake is turned forward, the foot brake is locked, i.e. it is stopping brake of roller.

The handle 16 of reversing control is turned forward, the roller moves forward. The hand is turned backward, the roller moves backward.

Switch on the vibration switch 14. Turn the amplitude selector 15 to left, it is the low amplitude vibration; and to neutral position, it will stop vibrating; and to right, it is the high amplitude vibration. If extinguish knob 24 is pulled forward, the diesel engine will be extinguished immediately and stops. Until the diesel engine stops completely, restore the extinguish knob to its original position.

V.2: Description of Instrument

The illustration of roller is shown in Fig 13a. There are five kinds of instruments.

Ampere meter 6, its reading should be within 0 -- 13A.

Oil temperature meter 5, its reading should be within 75 -- 85°C. And the highest temperature should not be beyond 90°C.

The pressure gauge 3 of engine oil, its reading should be within 160Kpa -- 270Kpa. When the rotation speed of the engine is at 500-600r/min, its reading should not be lower than 50Kpa.

The air pressure gauge 2, which indicates how much the air pressure is. Its reading should be within 0 --100 Kg.

Water temperature gauge 1 whose reading should be within the range from 75-85°C, and its highest readings should not exceed 95°C, and the lowest not lower than 40°C. Diesel oil level indicator 6, which is used for presenting the content inside diesel oil tank, and its indicating range should be within 0 -1. When the date it indicates is less than 0, you must refill in diesel oil.

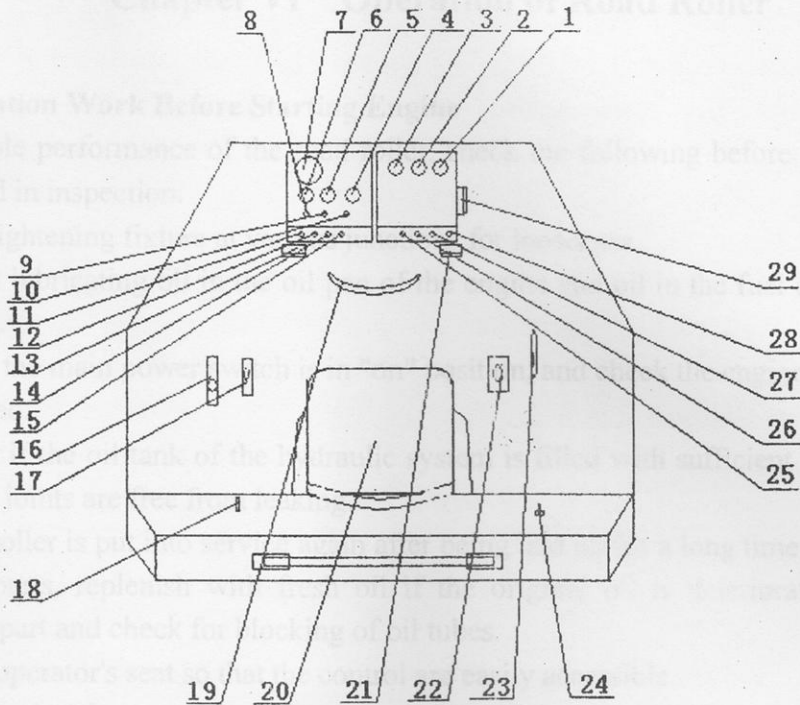


Fig. 13: Layout Diagram for Control Mechanism And Instrument

- | | |
|---------------------------------|----------------------------|
| 1. Water temperature gauge | 2. Air pressure gauge |
| 3. Diesel oil pressure meter | 4. Ampere meter |
| 5. Diesel oil temperature gauge | 6. Oil level indicator |
| 7. Tachometer | 8. Oil filter warning lamp |
| 9. Left turn signal lamp | 10. Right turn lamp |
| 11. Key switch | 12. Start switch |
| 13. Main clutch pedal | 14. Vibration switch |
| 15. Amplitude switch | 16. Forward/reverse lever |
| 17. Differential switch | 18. Power switch |
| 19. Steering wheel | 20. Seat |
| 21. Foot brake | 22. Shifting lever |
| 23. Hand brake | 24. Extinguish knob |
| 25. Front lamp switch | 26. Rear lamp switch |
| 27. Steering lamp switch | 28. Horn button |
| 29. Hand throttle knob | |

Chapter VI Operation of Road Roller

VI.1: Preparation Work Before Starting Engine

To ensure reliable performance of the road roller, check the following before operation and remedy any defect found in inspection.

- 1). Check all tightening fixture at various junctions for looseness.
- 2). Check that lubricating oil in the oil pan of the engine and oil in the fuel oil tank are filled with rated range.
- 3). Check that the main power switch is in "on" position, and check the engine inlet to see if it is has been blocked.
- 4). Check that if the oil tank of the hydraulic system is filled with sufficient oil of rated brand and the oil pipe joints are free from leaking.
- 5). When the roller is put into service again after being laid up for a long time, check the lubricating oil of all parts, replenish with fresh oil if the original oil is deteriorated. Lubricate all the lubricating part and check for blocking of oil tubes.
- 6). Adjust the operator's seat so that the control are easily accessible.
- 7). Check if the electric system and the wiper and headlight are normal
- 8). Before driving the road roller, check the emergency braking to see if it works properly.

VI.2: Engine Starting:

- 1). Hold on the hand brake joystick firmly.
- 2). Set the forward /reverse lever to the neutral position.
- 3). Put the vibrating control lever at the middle position, disengaging the main clutch.
- 4). Pull the throttle of the engine to the starting position on which the speed is around 800-1000rpm.
- 5). Insert the key switch and check that the fuel gauge and ampere meter indicate the normal readings, and turn the starter switch, then the engine should start immediately. If the engine does not start, wait for 1minute before attempting to start it again. And when restarting it again, restarting time should not be beyond 10 seconds.
- 6). As soon as the engine is running, the rotation speed should be reduced gradually. After warming up the engine for 5-10 minutes, the operator should observe all the gauges readings and running of the diesel engine.
- 7). If starting the engine at the very cold temperature, please refer to diesel engine manual.

VI.3: Travelling & Vibrating

- 1). Pull out the throttle to its full extent, i.e : the engine speed is 1800rpm.
- 2). Release the hand brake and step down main clutch pedal to make it disconnect with the power, then set the shifting lever to the desired position, and push the reverse lever to the desired direction. Step off main clutch pedal, the roller starts to move.

Note: When selecting the speed gear, it is not allowed to use 3rd gear-speed (the highest speed) at beginning, so you must apply 1st or 2nd gear-speed first, then you can change the speed into 3rd one.

- 3). Before driving the machine, check the emergency brakes to see if they work properly, and check if the steering system works actively.
- 4). Switch on the vibration switch, and turn the amplitude selector, then the machine will start vibrating.

Note: Don't apply vibrating on hard ground, otherwise it will damage the bearing of the machine. When the machine changing driving direction, then stop vibrating first. Don't apply vibrating when the machine is stationary, otherwise vibration will break the ground surface.

- 5). When applying vibration during working, keep a close watch at the instruments to see if its readings are in normal range. The hydraulic oil temperature should not be more than 85°C. (The reading of the vacuum meter on the filter should not exceed 0.03Mpa.)

VI. 4. Braking

- 1). While on the even and straight road, the roller can be stopped by moving the forward/ reverse lever to neutral position without treading on the foot brake.
- 2). In an emergency case, press the main clutch to disengage power, then tread on the foot brake to stop the roller immediately.

VI. 5 Parking And Stopping Roller

- 1) Switch off the vibration by moving the vibration switch and amplitude selector to neutral position.
- 2) Tread on the main clutch to disengage the clutch. Move the forward/reverse lever and gear lever to neutral position.
- 3) Move the throttle control to idling and allow the engine to run idle for 3-5 minutes.
- 4) Draw out the engine's extinguishing lever until the engine stops.
- 5) Turn the starter switch to position "0".
- 6) Pull the hand brake handle to the position for braking.
- 7) The roller should be stopped on the flat place by roadside. If it must be stopped on a slope, it is necessary to block the drive drum and vibratory drum by stone or similar obstacles.

VI.6. Towing, Hoisting And Transporting

1) Towing

- (1) Put the forward/ reverse lever to neutral position.
- (2) Turn the hand brake knob back to lever position. Release the hand brake.
- (3) Insert the towing rope or towing bar into front/rear towing hook.

Note: Max. towing speed being of 3 km/h, and max. towing distance being of 1 km.

2) Hoisting

- (1) Lock the articulation joint.
- (2) Fix the hoisting frame to front and rear hoisting holes.

Note: Ensure no part of roller would be crushed in order to avoid damage of distortion.

- (3) Ensure the lifting hook, pulley, chains and steel wires are all safe.
- (4) After hoisting, ensure to restore the articulation joint unlocked before driving.

3) Transporting

- (1) When transporting at short distance, let the roller self-go at the 2nd or 3rd gear according to the road condition. It is prohibited to apply 3rd gear at starting, the 3rd gear can only be shifted from 2nd gear.
- (2) When transported at long distance, the roller should be mounted on a platform trailer.

Note: During hoisting and transporting, the front and rear frames should be locked to avoid relevant movement, and the roller should be firmly secured on the trailer and train.

VI. 7. Cleaning And Storage for the Roller

1. Cleaning

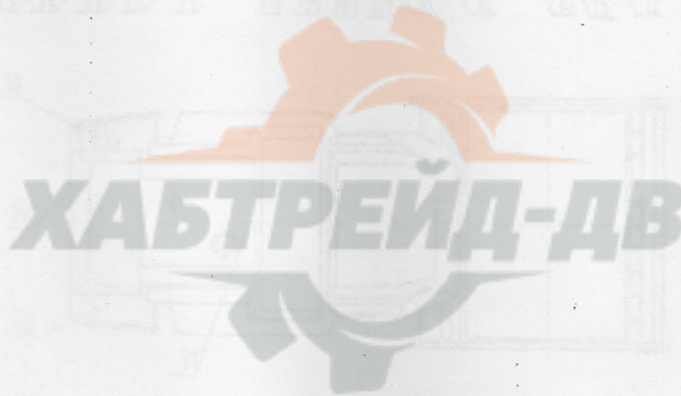
Move the filth and dirt away from the roller after operation. Exercise caution when cleaning diesel

engine, generator, injection pump of starting motor, injector, hydraulic pump, motor, hydraulic pipes and their outside. Keep them clean by dry and soft cloth.

For long-term lay-up,. Drain off any water present in the engine tank. Wipe off filth and dirt from the machine. Clean the outside of every part and all lubricating nipples with kerosene, and grease them. Coat grease and anti-rust glue to the exposed unpainted parts.

2. Storage

The roller should be stored at a dry garage. The ground should keep dry and the whole machine should be covered with a tarpaulin, in case it has to be stored outdoors. For longer time storage, the rear axle should be padded up to make the tire off the ground, and the front axle should be lifted up to protect the absorber from pressure, Start the roller every three months and have it run 10-15 minutes.



Maintenance Checking Points

- | | | |
|--------------------------------------|--|----------------------------|
| 1. Engine oil pump | 2. Engine air valve | 3. Engine oil level |
| 4. Air filter | 5. Hydraulic oil filler | 6. Hydraulic oil filter |
| 7. Hydraulic oil level indicator | 8. Hand brake | 9. Foot brake |
| 10. Vibrating drum lubricator filter | 11. Scraper | 12. Damper and fasten bolt |
| 13. Vibrating motor and prop. | 14. Vibrating drum oil level plug | |
| 15. Articulated frame | 16. Steering cylinder | 17. Brake |
| 18. Side transmission | 19. Gear | 20. Multi-pass valve |
| 21. Rim | 22. Tyre air pressure | 23. Tyre fasten bolt |
| 24. Engine fuel and lubricant filter | | 25. Diesel tank drain plug |
| 26. Diesel tank filler | 27. Engine oil and hydraulic oil reservoir | 28. Diesel filter |
| 29. Diesel tank | 30. Clutch | 31. Clutch |

Chapter VII : Roller Maintenance

In order to maintain satisfied working performance and operating life, the customers are required to carry out maintenance on the rollers in regular interval.

VII. 1: Inspection And Maintenance Points

I. Inspection and maintenance points on roller as shown in Fig. 14.

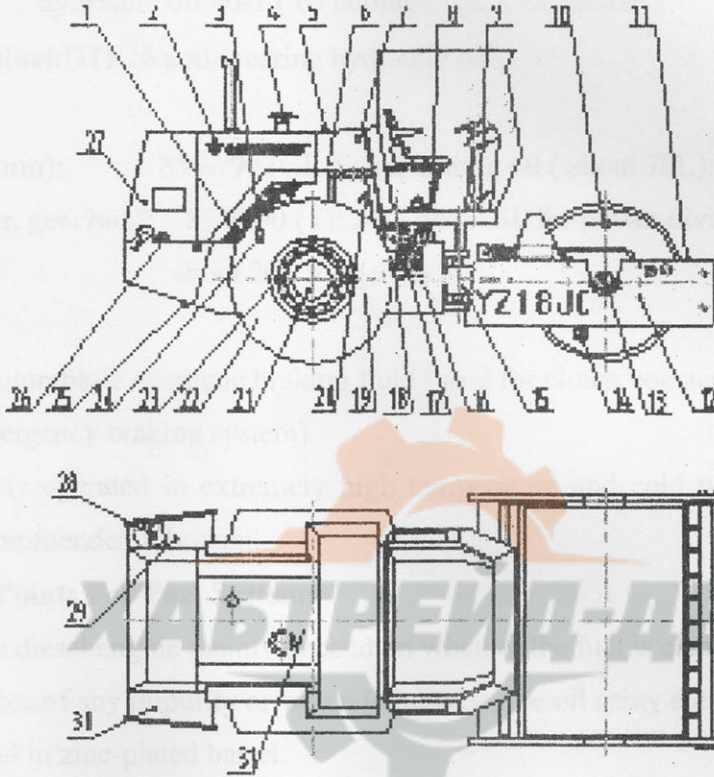


Fig. 14: Maintenance Checking Points

- | | | |
|--------------------------------------|---|----------------------------|
| 1. Engine oil pump | 2. Engine air valve | 3. Engine oil level |
| 4. Air filter | 5. Hydraulic oil filler | 6. Hydraulic oil filter |
| 7. Hydraulic oil level indicator | 8. Hand brake | 9. Foot brake |
| 10. Vibrating drum lubricant filler | 11. Scrapper | 12. Damper and fasten bolt |
| 13. Vibrating motor and pump | 14. Vibrating drum oil level plug | |
| 15. Articulated frame | 16. Steering cylinder | 17. Brake |
| 18. Side transmission | 19. Gear | 20. Multi-pass valve |
| 21. Rim | 22. Tyre air pressure | 23. Tyre fasten bolt |
| 24. Engine fuel and lubricant filter | 25. Diesel tank drain plug | |
| 26. Diesel tank filler | 27. Engine oil and hydraulic oil radiator | 28. Diesel filter |
| 29. Diesel tank | 30. Battery | 31. Clutch |

V.II.2: Lubricant And Hydraulic Oil:

1. **Lubricating grease:** Lithium based grease
2. **Engine oil:** Diesel Engine (Please see the Diesel Engine Manual for oil quantity,
15W/40

3. **Hydraulic oil:** (total amount: about 160L)

Local product: low solidifying point, thick and anti-wearing

hydraulic oil 40-1 (be adopted when ex-factory)

Imported product:DTE26 anti-wearing hydraulic oil

4. Lubricant:

(**Vibrating drum**): 85W/90 (GL-5) lubricating oil (about 70L)

(**Power divider, gearbox**): 85W/90 (GL-4) (about 3L for power divider, and
about 20L for gear box)

5. Gear oil:

(Brake): 7103 automobile synthetic braking fluid (used for clutch booster cylinder
and emergency braking system)

In case the roller is operated in extremely high temperature and cold weather, please contact our factory for the recommended lubricant.

VII.3 Important Points For Fuel System:

Working life of the diesel engine mainly depend on whether the fuel is clean or not.

- Keep the fuel free of any impurity or water. Otherwise, the oil spray element shall be damaged.
- Do not keep fuel in zinc-plated barrel.
- Before the oil barrel being opened, it should be placed motionlessly for a long period of time.
Never roll the fuel barrel for the plug right before the fuel being drawn out.
- Do not stir up the sediment on the bottom of the fuel barrel with the sucking tube.
- Fuel should be kept in a safe place.

VII.4. Important Points for Hydraulic System:

Upon performing maintenance on hydraulic system, to keep everything clean is the most important. It should guarantee the hydraulic system free of any dust or impurity. Any small particles in the system shall scrape the pump to make it blocked, make the throttle valve blocked or cause internal leakage, so as to cause expensive maintenance.

- Upon daily inspection, if any hydraulic oil level dropped, all the pipework hoses and leaking items should be checked.
- Stop the leaking items from operation immediately. If necessary, inform our customer service department.
- Do not place the hydraulic oil barrel in the open air, unless with a protective covering at least.

- When there is any weather change, no water is allowed to come into the fuel barrel.
- Should the fuel barrels have to be placed in the open air, they should be put in a level surface.
- Before the hydraulic oil being drawn out, the fuel barrel should be placed vertically and motionlessly for a long period of time. Never roll the fuel barrel to the drain place.
- In order to prevent any dust coming into the fuel, all the elements and working area should be cleaned before the oil being drawn out.
- If possible, using filtering elements to fill in hydraulic system.
- In order to keep any dirt, impurity and water from the fuel tank, do not let the fuel tank in the open air without any cover longer than necessary.

VII.5. Maintenance Interval And Items:

Refer to the Operation Manual for Diesel Engine compiled by Shanghai Diesel Engine Factory .

1. Daily Maintenance (Every 10 Hours Operation)

- 1) Adjust the scrapper(see Fig. 13)
 - a. Loosen the fasten bolt for the scrapper;
 - b. Make the scrapper fit in the place 10mm away from the vibrating drum;
 - c. Refasten the scrapper bolt.
- 2) Engine oil level inspection:
 - a. Drive the roller to a level surface, and extinguish the engine;
 - b. Take out the oil rod, and inspect the oil level;
 - c. If the actual oil-level close to or lower than the mark on the rod, it should be refilled with engine oil. See Fig. 14 for the volume and method of refilling. When the oil level lower than the mark "L" (oil level low) or higher than the mark "H" on the rod (oil level high), it is not allowed to start the engine. It is allowed to check the oil level at least five minutes after the diesel engine being stopped, so as to make enough time for the engine oil to return to the oil pan. The difference between the high oil level to low level is 3.6L.

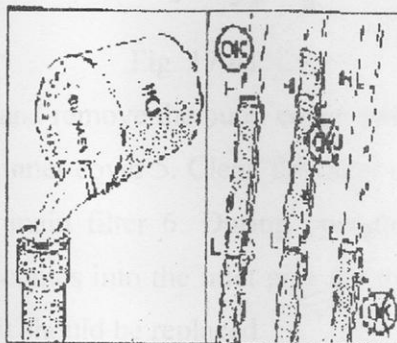


Fig. 15: Refill plug and the amount of oil to be refilled

3) Hydraulic oil level inspection:

- a. Drive the roller to a level surface, and observe the oil mark. If the hydraulic oil level is lower to the mark more than 2mm, refill with the same brand hydraulic oil. Don't mix different brands of hydraulic oil together.

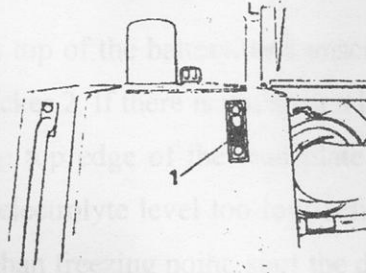


Fig. 16 Hydraulic oil tank

4) Handbrake adjustment:

Make the handbrake maintain a good performance. Otherwise, it is necessary to make the adjustment.

5) Refill the diesel tank:

Open the tank cover with the key. Refill the diesel tank daily, till it reaches 4/5 of the tank. Use winter diesel in wintertime to avoid paraffin sediment to cause the oil too dense.

6) Inspecting the braking fluid level.

Ensure to refill the braking fluid to be full.

2. Weekly Maintenance (Every 50 Hours Operation):

1) Air filter cleaning:

Depending on the amount of dust, clean it after every 10-50 hours of operation.

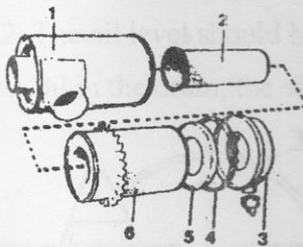


Fig. 17 Air filter

Loosen the clamping stirrup 4 and remove the outer cover, twist off the butterfly nut in the middle of the filter, and dismantle the inner cover 5. Clean the outer cover 3 with clean cloth. Loosen the butterfly nut and remove the main filter 6. During operation, ensure that no dust could pass through the filter, and no dust comes into the inlet pipe for the engine. If there is any connecting hose or other element leaking, it should be replaced.

Wipe the inner surface of the filter outer casing 1 with clean cloth, and clean the inlet pipe with clean cloth.

Ensure there is no damage on the connecting items between the filter outer casing and engine and none for the hoses as well. No leakage is allowed on the a.m. parts.

2) Check the oil pipe and coupling to avoid any leakage.

3) Battery inspection:

Open the battery casing, clean the top of the battery, and unscrew plug 1 for each battery. Check the electrolyte level with level checker 2. If there is not such a level checker, place a clean wooden stick in the case till it reaches the top edge of the lead plate. The stick should be soaked with electrolyte with 10-15mm. If the electrolyte level too low, refill with sufficient distilled water. If the ambient temperature is lower than freezing point, start the diesel engine for a period of time to prevent the water from being frozen. If any corrosion being detected on the battery poles, it should be erased right away, and a vaseline coating should be adopted.

For the machine specially required, we adopt the maintenance-free battery imported, which only needs inspection on cable connection and recharging if necessary.

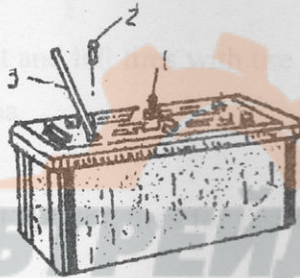


Fig. 18: Battery

4) Vibrating drum oil level inspection:

Drive the roller to a level surface. Make the plug 1 turn to its highest position (Fig. 19). Make a visible inspection to oil level plug 2. The oil level should be at middle mark.

Note: If there is too much or too less oil in the drum, the vibrating axle would be over-heated.

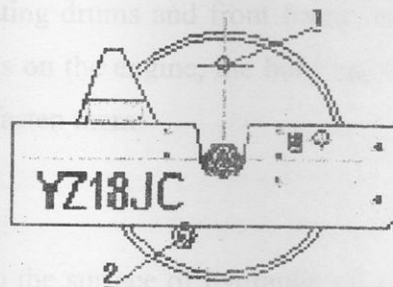


Fig. 19: Vibrating drum oil level inspection

5) Damper and fasten bolt inspection:

Ensure there is no damage on the rubber damper and the fastening bolt being fastened properly. If any crackle with the depth of 20-25mm being detected, it should be replaced with a new rubber damper.

6) Articulated points lubricating:

Four bearings in the articulation shall be lubricated with lithium-based grease injected by oil cups M10×1 as shown in the Fig. at place 1,2,3,4. After lubricating, leave a small amount of grease on the grease nipple so as to prevent dust from coming into.

If it fails to let the grease go into the bearings, a jack is required to reduce the bearing load, and then refill.

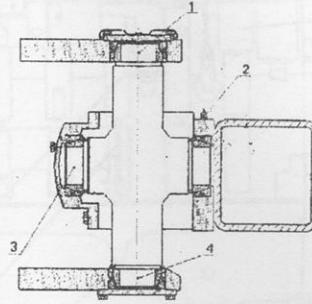


Fig. 20 Hinge Lubricating

7) Tire air pressure inspection:

Check the air pressure for both right and left tires with tire air pressure gauge. And ensure the tire pressure should be at 0.25—0.35Mpa.

8) Tire fasten bolts inspection:

Check the fasten bolts on both right and left tires for fastening with 500Nm (50Kgfm) torque. If lower than this value, re-fasten.

9) Steering cylinder mounting items lubricating:

After greasing the hinge, refill the grease nipples at the right and left sides of the steering cylinder with sufficient (lithium-based) grease. It is requested with the same proceedings as before, so the grease should come into the bearings as well.

10) Checking and fastening the bolts on very major components

Firstly, check the bolts on the vibrating drums and front frame, the bolts on the cross-shaft in the middle of articulated frame, the bolts on the engine, the bolts on the clutch housing and the bolts on the motor. If there is any loosening, fasten them.

3. Two week maintenance:

Hydraulic oil cooler surface cleaning:

Wipe out the dust and greasy dirt on the surface of hydraulic oil cooler. Flush the cooler ventilating pass with compressed air or high-pressure water. It should be even better, if steam injecting cleaner is available.

4. Every Month Maintenance

(1) Engine oil and filter-changing

It is better to change engine oil while the engine is warm because in such a case dirt can be easily mixed and drained off together with hot oil. Before draining, clean the oil drain plug 3 and the

outside of the filler cap 1 (Fig. 21). Place a receptacle for at least 15 liters under the oil draining plug. Undo the oil drain plug 3 to drain off all used engine oil and then screw it on. Fill in new engine oil from filler 1 up to the upper mark off lipstick 2, but never pass beyond. Run on trial for a short period and then check the oil level again. The volume of new oil should be around 12 liters.

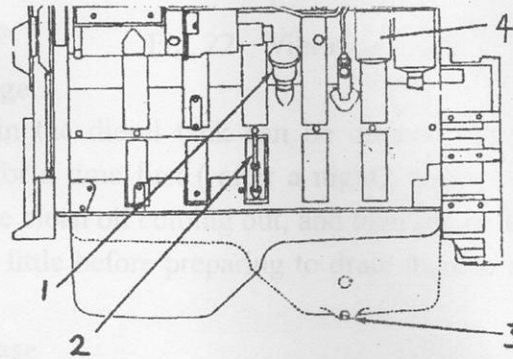


Fig. 21 Side View of Engine

When changing engine oil filter, loose filter 4, discard the used filter as useless, apply clean new engine oil on the rubber seal ring and then tighten for half one more turn. Start the diesel engine and check the engine oil pressure and sealing condition of the filter during running. If some air comes into fuel system while changing, the engine can not start, so the air should be let out from the system.

Change the filter element very carefully in case of polluting the hydraulic oil. After assembly, start the diesel engine and check whether there is leaking around the filter.

Note: Replace the hydraulic filter element after one month the new machine being used or the hydraulic oil being replaced. Aftermath, replace the filter element at interval of 3 months.

(2) Brake system---checking

Step on the pedal brake. If it does not work, check and maintain it immediately.

- a. Whether there is leaking in the oil pipes and joint points.
- b. Whether there is enough brake liquid, be sure to add it up to the correct level at all times.
- c. Whether there is leaking inside the brake cylinder.

(3) Gear box---checking the oil level

While checking the oil level, be sure to park the roller on a level surface for 5 minutes. After the oil fully returns back the oil cavities, observe the oil lip sticks in the front and rear cavities. The oil level should be kept between the upper and lower marks, if not, replenish it from the filler plug.

5. Every Three Months (every 500 operating hours)

- (1) Adjust the air valve gap. (see Diesel Engine Manual)
- (2) Replace the hydraulic oil filter element.

6. Every Six Months (Every 1000 operating hours)

(1) Engine oil of the drum---replacement

Position the roller on a slope with the drain plug 1 at the lowest position (Fig. 22). Remove the plug 1 and drain all oil out into a receptor. Then park the roller on a level surface with the plug 1 at the highest position. Fill in new oil through the plug 2, and the oil will flow out from plug 2. The oil amount should be correct, not too much or too little. Since the oil cavities in the drum is going-

through, so it is ok to check only one side of the oil level.

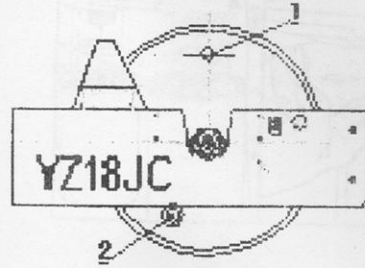


Fig. 22 Vibrating drum

(2) Diesel engine—drainage

The water and sediment in the diesel tank can be drained out through the bottom plug. Before draining, park the roller for a time first (after a night), remove the plug, drain out the water and sediment until there is some clean oil coming out, and then put on the plug again. It is better to lift up one side of the roller for a little before preparing to drain thereby all the sediment may gather at the same drain plug.

(3) Fuel system—air release

If there is air in the fuel system, the diesel engine can not be started or extinguished, so the air should be exhausted. When preparing for exhaustion, loose plug 1 (Fig. 23), operate oil lever 2 of the supply pump by manual until there is diesel oil without air coming out from plug 1, and then tighten it. While operating the oil pump by manual, if there is no diesel oil coming out from the plug, put a 36cm spanner on the crankshaft nut, and then start the engine.

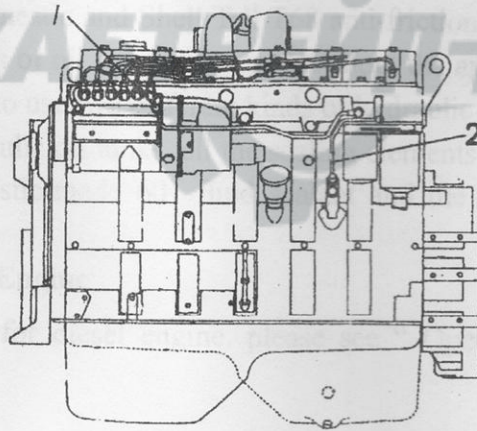


Fig. 23: Side view of the injection pump of diesel engine

Air should also be discharged from removed high-pressure pipes. Loosen the connecting nuts of these pipes, open all the oil valves, operate the starting motor, then tighten the connectors after there is some diesel oil without air come out through the connecting nuts.

(4) Fuel filter—replacement

Clean the head of the fuel filter. Discharge the filter, and clean the washer of the head of the fuel filter. Change the O-ring.

Fill a new fuel filter with clean diesel oil and lubricate O-ring with clean engine oil.

Caution: When fitting the fuel oil filter, turn it for 1/2 to 3/4 more turn after touching the O-ring. Over tightness may cause the screw thread to get out of shape or damage the seal ring of the filter.

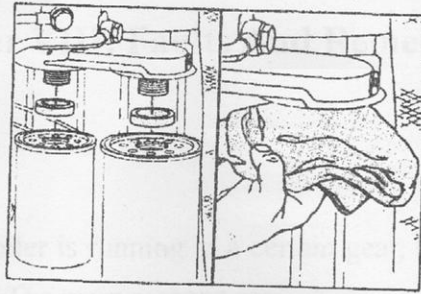


Fig. 24

7. Every Year Maintenance (Every 2000 Operating Hours)

(1) Hydraulic oil tank –changing the hydraulic oil

While maintaining the hydraulic system, it is very important to ensure the number, quality and cleanliness of the hydraulic oil because these may affect the roller's normal operation and service life. When changing the hydraulic oil, it is better to use a tanker which is filtered by a 10u filter to fill up the oil. Pay attention to the followings when changing oil:

- a. Clean the outside of the oil tank thoroughly. Remove the filter cap carefully in case some dirt may fall into the tank.
- b. It is a must to use a very clean brush or cloth.
- c. The oil should be drained out while it is hot because hot oil can be easily mixed with impurities and has a good fluidity.
- d. It is always acceptable to use low- solidify 40 anti-friction hydraulic oil (made by Shanghai Refinery Factory) in domestic and Shell Tell T68 anti-friction hydraulic oil when machines being used abroad. Other kinds of oil can not be used without the approval of the roller manufacturer in domestic. Never permit to use two different kinds of hydraulic oil at the same time.
- e. After cleaning the hydraulic oil tanks, all the sealing elements should be reliable, i. e.: no leaking. Normally use the domestic-made 601 fluid sealant and the imported "Loctite" to ensure good sealing .

8. Maintenance for Diesel Engine

As for the maintenance for diesel engine, please see " Operation and Maintenance for Diesel Engine " for details.

Chapter VIII: Faults And Remedies

VIII. 1: Gearbox

Trip of gear:

Trip of gear means when the road roller is running at a certain gear, the gear-shifting lever will jump to the neutral position automatically. The main reasons are:

1. It is more inclined to cause trip of gear if the teeth are badly worn out, especially the short teeth which are engaged with slide gear. If the teeth are worn out unequally in length which make the gear form a taper, thereby an axial thrust will occur which may cause trip of gear, that means the gear should be replaced by a new one immediately.
2. The meshing of gears is not enough, which should be adjusted during assembly.
3. The self-lock mechanism of the shifting fork does not work, such as the self-lock spring is too soft. When this happens, change it timely.
4. The ball bearing is so badly worn out that the axes are not concentric. Change with a new bearing.

Noise

When the engine is working without load, listen carefully whether there is noise produced from gearbox. Stop the engine and check if abnormal sound occurs. This may due to overwearing or even breaking of the bearing or gear, or too little lubricant. Replace with a new without lay.

Oil leaking

The leaking parts of gearbox can be found visibly. This may due to wearing, hardening or lack or elasticity of oil seal. Looseness of the drain plug and crack of the body of gearbox may also cause oil leaking. Pay attention to the edge of the oil seal when changing it in case it may be damaged by screw thread and shoulder. Remember to apply lubricating oil when fitting the shaft.

VIII. 2: Brake

Emergency brake is of clamp plate brake with hydraulic compound boost system. Its main fault is that brake does not work.

Analysis:

1. Blockage of the oil pipe or lack of oil;
2. Deterioration of brake liquid mixed with other oil;
3. Breakage of the oil pipe or having air in the system;
4. Oil leaking in the brake liquid cylinder or brake valve.

VIII. 3: Vibrating Drum

Main faults of the vibrating drum are overheating or oil leaking. Overheated vibrating drum may burn the bearing of the vibrating shaft. The reasons are:

1. Too much or too little cooling lubricant. The oil in the vibrating drum oil tank not only lubricates but also cools the bearing. Bearing can not be cooled well because of too little oil, thereby lubricant will be damaged under high temperature which may burn the bearing. If there is too much oil, the

bearing can also be burned because under the stroke of the eccentric vibrator with high speed and high frequency, oil will be fogged, thus severe strike of the oil fog molecule will cause the temperature rise quickly.

2. Too narrow clearance of radial or axial direction of bearing. When the bearing is working, there is a certain free gap between inner and outer ring and ball. The bearing is working with high speed under heavy load. High temperature will make the bearing expanded and get out of shape. If the clearance is too narrow, the bearing will be burned because expansion may narrow the free gap of the bearing.

Therefore, add lubricating oil according to the manual.

Oil leaking is due to inefficient sealing or loose screw.

Special attention should be paid to the shaft-end seal of vibrating motor. If the seal does not work, gear motor will make the hydraulic oil leak into oil tank of vibrating drum. Therefore, when the seal is damaged, make sure to check whether the oil of vibrating drum is mixed with hydraulic oil. Change with new lubricating oil if that happens. Otherwise, oil will become deteriorated because of chemical reaction of these two kinds of oil. Also the high temperature of vibrating drum will damage sealing and bearing.

VIII. 4: Hydraulic Vibrating System

Elements of this system (variable pump, motor) work under high pressure, so the processing and assembling for this system need high accuracy. It is usually not allowed to discharge by the user if there is no certain testing equipment or instrument. It is also not allowed to adjust the pressure of every part if there is no pressure gauge.

If it is found that the vibrating pump without pressure feeding, firstly check if the oil level is all right; then check if or not the oil- feeding pipe is blocked. If you find everything works properly, then replacing the oil-feeding pump is necessary.

When you find that the pressure feeding is not sufficient, then replacing the oil filter is your first consideration.

When it is found that there is only one amplitude, firstly check if the electric-magnetic direction shifting being in position. If you find that this direction shifting is in position, then check how much the pressure of high-pressure gauge is. When this pressure is very low, then the reason of problem lies in its system leakage or the pressure of adjusting valve was set too low, then it is necessary to check the valves block of the system. If the system pressure is all right, but there is still not vibration, then check the assembly status of vibrating drum and spline sleeve.

If you find the vibrating frequency is not enough, then you can ask the qualified person to reset the pump displacement till the technical parameter could be met.