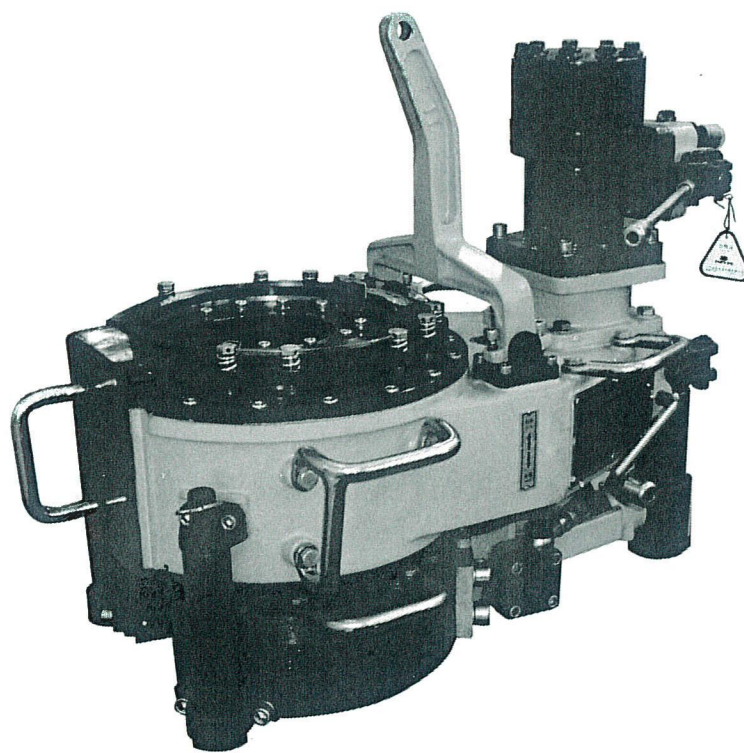


XQ114/6YB 型修井动力钳

使用说明书



安全注意事项

- 1、操作者必须阅读并熟悉本说明书内容，了解动力钳结构性能、工作原理、工作过程，各操作手柄的作用及安装维护的有关要求。
- 2、动力钳操作范围内严禁放置其它杂物，操作者必须穿好工作服、安全鞋，戴好安全帽、安全手套等。
- 3、操作使用前必须先查验悬吊机构、尾绳联接、弹簧吊筒、液压管线等安装是否联接完好，牢固可靠。
- 4、操作人员必须在钳体侧面操作，上、卸扣操作时必须关闭好安全门，动力钳运转时不得将手及衣服靠近旋转部分。
- 5、上、卸扣时操作主、背钳换向复位旋钮见标牌所示，避免操作失误。
- 6、在维护或更换颚板、牙座、钳牙等其它零件时，应将动力钳退离井口，并切断液压阀组液压源。
- 7、严禁超压、超扭矩使用动力钳，不得任意拆卸或添加零部件。
- 8、为确保动力钳正常安全运行，请使用原厂配件。

目 录

- 一、概述
- 二、技术参数
- 三、安装
- 四、液压系统
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- 六、润滑与维护
- 七、常见故障及排除方法
- 八、鄂板、牙块规格推荐选用表
- 九、压力扭矩对应表
- 十、附件及零件明细表

一、概述

XQ114/6YB 型修井动力钳是在油田修井作业中用来上卸油管螺纹的中型动力钳。本动力钳具有以下特点：

- 1、新型液动背钳与主钳配套形成组合钳，操纵主钳上的手动换向阀，背钳即自动同步夹紧、同步松开管柱，动作灵活可靠。
- 2、主钳及背钳更换不同的颞板，即可夹紧不同规格的管柱及接箍，颞板装取方便。
- 3、两档变速级差大，高档速度快，低档扭矩大。
- 4、钳头制动机构及转向控制机构设置在钳头上部，性能可靠，安装、调整、维修极为方便。
- 5、悬吊主钳，背钳浮动于主钳之下，背钳胶管通过接头与主钳相联，主钳和背钳易于组合使用，也易于分离搬迁。
- 6、可选配扭矩控制系统，用以显示、记录和控制上扣扭矩。

二、技术参数

1、适应范围	$\Phi 60 \sim \Phi 114 \text{ mm}$	(2 3/8"~4 1/2")
2、高档最大扭矩	1.5kN·m	(1106 lbf.ft)
3、低档最大扭矩	6.0kN·m	(4425 lbf.ft)
4、高档最高转速	85r/min	
5、低档最高转速	20r/min	
6、额定系统压力	12Mpa	(1740 Psi)
7、最大供油量	100L/min	(26.42 gpm)
8、开口尺寸	118 mm	(4.65 in)
9、移运质量	260kg	(573 lb)
10、组合外形尺寸	850×500×600 mm	(33.5×19.7×26 in)

三、安装

- 1、悬吊。将吊筒与主钳悬吊杆（Z6—42）相联，把动力钳悬吊于修井机井架上。悬吊点离井口 15m 以上。在自由悬吊状态下，动力钳钳头中心离井口约 0.5m。悬吊高度以背钳恰好卡着油管接箍为宜。

2、调平。调整悬吊杆（Z6—42）上的调节螺钉，使动力钳保持水平。如不保持水平会使夹持失效。

3、结尾绳。尾绳一端结在井架上，另一端结在动力钳的尾座（Z6—32）上，尾绳拉力应能承受 20kN 负荷。当动力钳处于上扣状态时，尾绳应与动力钳保持垂直，从而保证通常站在操纵手柄一侧的操作者的安全。

4、接通液压源。联接来自液压源的高压胶管，供油胶管接手动换向阀的上部油口，回油胶管接手动换向阀的下部油口。切勿接错位置。

四、 液压系统

动力钳液压原理如下图所示：

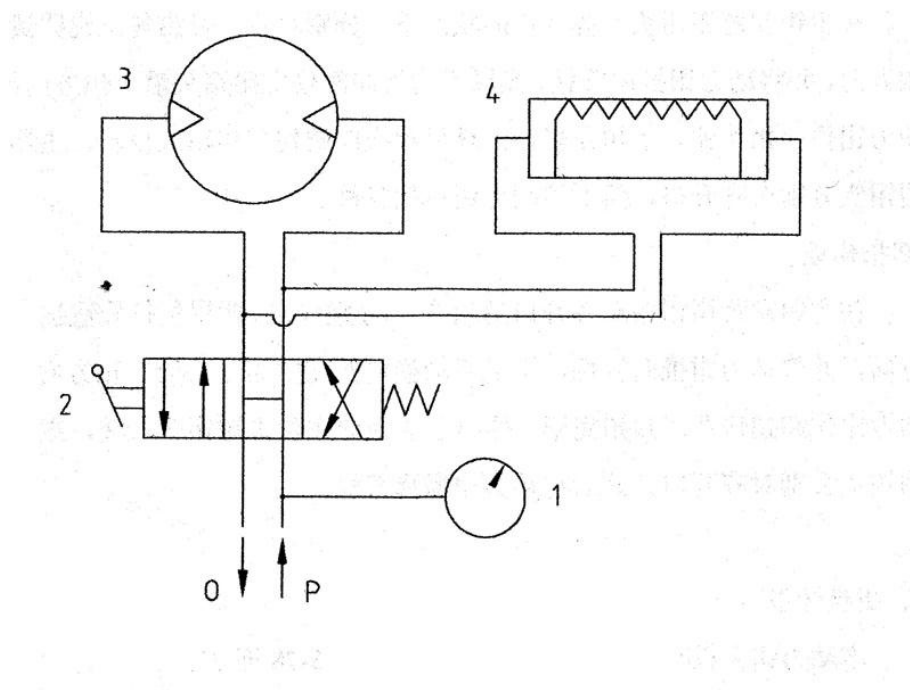


图 1

- 1、压力扭矩表：显示压力和扭矩（选用件）。
- 2、手动换向阀：控制主钳马达、背钳油缸的联动及上扣或卸扣运动。
- 3、液压马达：驱动主钳钳头旋转及夹紧管柱。
- 4、背钳油缸：驱动背钳正反方向运动及夹紧接箍。

五、操作说明

1、更换颞板

本动力钳的主钳及背钳的颞板均为自由式安装，即颞板可从中心空间装入和取出。在主钳和背钳的颞板架开口两侧，设有定位螺钉（Z6—81）、（B6—25），使颞板（Z6—79）、（B6—31）限位，使其在搬运中不掉出。需要取出颞板时，启动主钳和背钳，使定位螺钉从钳头开口处露出，退出主钳定位螺钉（Z6—81），从钳头中心取出或装入主钳颞板总成。新装入的颞板，其规格号码必须与夹持管柱直径一致。退出背钳定位螺钉（B6—25），从背钳开口处取出或装入背钳颞板总成，新装入的颞板，其规格号码必须与夹持接箍的直径一致。

2、换档操作

操纵手动换向阀（Z6—33），并下压拨叉轴（Z6—90）挂档为高速档。操纵手动换向阀（Z6—33），并上提拨叉轴（Z6—90）挂档为低速档。换档操作必须在较慢的转速下进行，以防损坏齿轮。

3、上卸扣操作

上扣操作

在主钳和背钳钳头对齐开口的状态下，分别将复位旋钮（Z6—49）、（B6—3）搬向上扣方向，并将动力钳推向管柱，操纵手动换向阀（Z6—33）使主钳沿上扣方向旋转，进行上扣。上扣完毕，操纵手动换向阀（Z6—33）使主钳反转，主钳、背钳钳头分别对齐开口，然后将动力钳撤离管柱。即完成一次上扣操作。

卸扣操作

在主钳和背钳钳头对齐开口的状态下，分别将复位旋钮（Z6—49）、（B6—3）搬向卸扣方向，并将动力钳推向管柱，操纵手动换向阀（Z6—33）使主钳沿卸扣方向旋转，进行卸扣。卸扣完毕，操纵手动换向阀（Z6—33）使主钳反转，主钳、背钳钳头分别对齐开口，然后将动力钳撤离管柱。即完成一次卸扣操作。

4、更换钳牙

用螺丝刀顶进颞板上的钳牙挡销（Z6—74），即可取出钳牙。

钳牙有大圆弧和小圆弧两种。钳牙背面标有适用尺寸。大圆弧钳牙适用于夹紧 89~141.5（3 1/2"~4 1/2"）的管子或接箍。小圆弧钳牙适用于夹紧 60~78（2 3/8"~3"）的管子或接箍。

六、维护与润滑

- 1、 每次搬运后,用煤油或柴油清洗主钳及背钳钳头,并向机体各油嘴注黄油。
- 2、 清洗钳头后,给颞板、颞板架、开口齿轮打黄油。
- 3、 如因制动力不足,颞板不伸出,需调紧制动压力,稍拧紧各带孔螺栓(Z6—54),且注意不能拧得过紧而使摩擦片过热。
- 4、每次用过后,检查钳体,如有积水或油泥脏物,必须及时清除。
- 5、每用过一井次,必须向各转动销轴注机油。
- 6、不得用蒸气清洗钳子,以防各轴承失油、进水而损坏。
- 7、液压油温度不得超过 65℃,过热会使液压系统密封失效。
- 8、液压油必须保持清洁,保持滤油器正常滤油,如油已脏,需及时更换。
- 9、液压油选用:
 - (1) YC—N46 低凝液压油,适用于环境温度 -20℃~+40℃;
 - (2) YB—N46 抗磨液压油,适用于环境温度 -10℃~+40℃;
 - (3) YA—N46 普通液压油,适用于环境温度 0℃~+40℃。

七、常见故障及排除方法

常见故障	原因	排除方法
钳牙打滑	1、颞板选用不当	更换成相应适用范围的颞板 (Z6—79)、(B6—31)
	2、钳牙沟槽为坚硬杂物充填	清除钳牙沟槽中的杂物
	3、钳牙过度磨损	更换新钳牙
	4、钳头制动力矩偏小	适当调紧制动弹簧(Z6—28)
	5、钳体不水平	调平钳体(主钳和背钳)
主钳或背钳钳头 对不齐开口	挡销(Z6—69)、(B6—5)不 为复位旋钮包容	搬转复位旋钮(Z6—49)、 (B6—3) 180°再复位
主钳卡紧正常,背 钳打滑	背钳颞板架转向与主钳转向 相反	调换背钳两胶管位置
挂档不牢固,易脱 落	锁紧力偏小	加调整垫,适当增大弹簧 (Z6—28)的压力

八、鄂板、牙块规格推荐选用表

1、鄂板规格

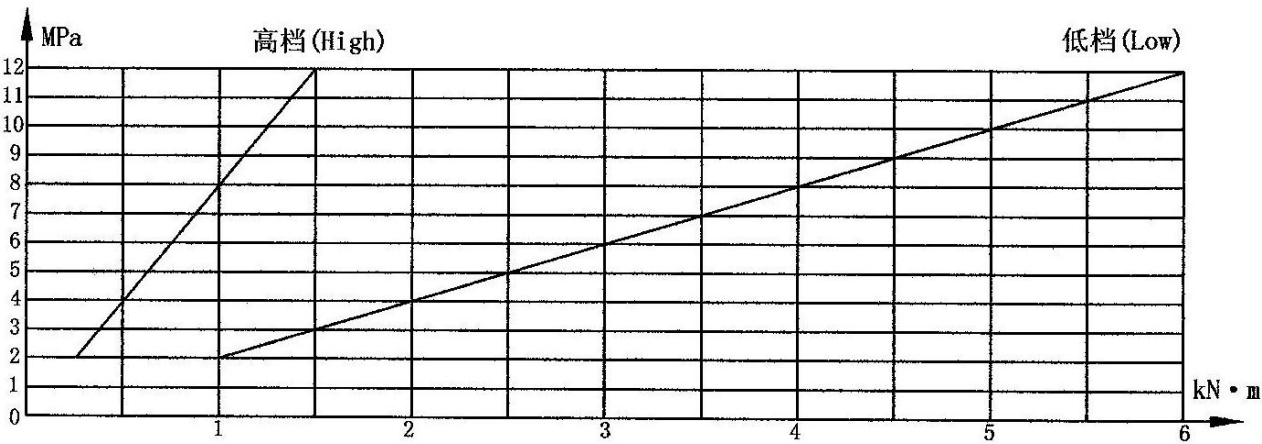
油管规格		主 钳		背 钳			
公制	英制	鄂板（钢号）	牙板（钢号）	鄂板（钢号）		牙板（钢号）	夹持部位
φ60	2 3/8"	60-56 （选用件）	60-78 (R35)	63-60	选 用 件	60-78 (R35)	本体
				73-70			接箍
				78-75			加厚接箍
φ73	2 7/8"	73-69		73-70			
φ89	3 1/2"	89-85	89-142 (R50)	93-89		89-142 (R50)	接箍
				93-89			本体
				114.5-107			接箍
114.5-107		小钻杆					
		本体					
φ105 小钻杆		105 （选用件）		114-110	141.5-132.5		接箍
φ114	4 1/2"						

注：客户可根据需要订购

2、牙块规格

油管尺寸	主钳和背钳牙块	
	采购代号	标识
60-73	Z6-73（A）	60-78
89-114	Z6-73（B）	89-142

九、压力扭矩对应表



十、附件及零件明细表

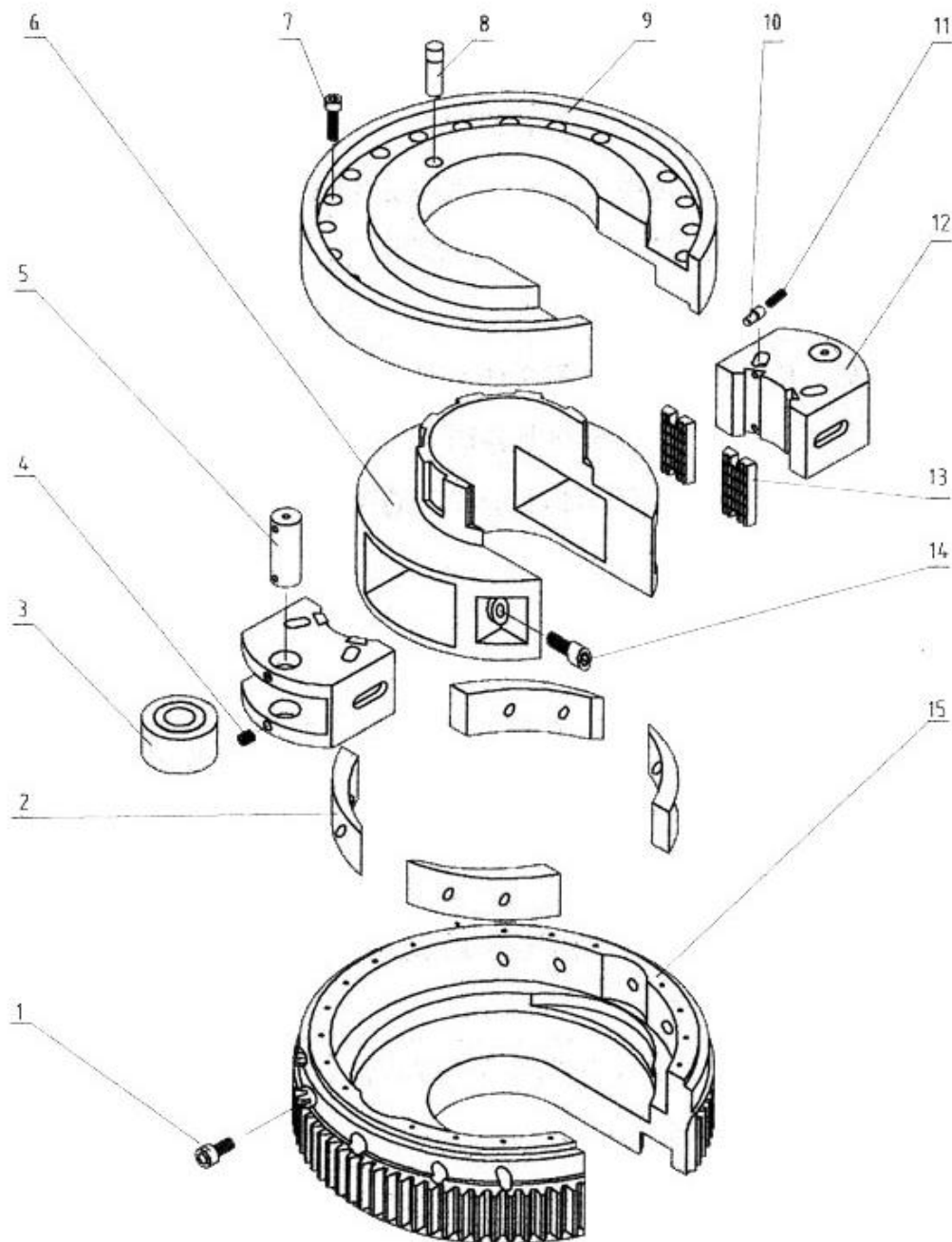


图 1 主钳锚头总成

序号	采购代号	代 号	名称及规格	数量
1	Z6—1	GB/T70.1-2000	内六角圆柱头螺钉 M10×20—8.8	8
2	Z6—80	XQ6B.Z-01-10	主钳坡板	4

3	Z6—78	XQ6B.Z-01-1	滚轮		2
4	Z6—77	GB/T71-1985	开槽锥端紧定螺钉 M10×10		8
5	Z6—76	XQ6B.Z-01-2	滚轮轴		2
6	Z6—71	XQ6B.Z-01-11	主钳颚板架		1
7	Z6—68	GB/T70.1-2000	内六角圆柱头螺钉 M8×30		19
8	Z6—69	XQ6B.Z-01-7	挡销		1
9	Z6—70	XQ6B.Z-01-8	开口齿轮盖		1
10	Z6—74	XQ6B.Z-01-4	牙板挡销		48
11	Z6—75	XQ6B.Z-01-3	弹簧		48
12	Z6—79	XQ6B.Z-01-5A	颚板 73-69	标准配置	各 2
		XQ6B.Z-01-5B	颚板 89-85		
		XQ6B.Z-01-5C	颚板 114-110		
		XQ6B.Z-01-5D	颚板 60-56	选用件	
		XQ6B.Z-01-5E	颚板 105		
13	Z6—73	XQ6B.Z-01-6A/B	牙板（R35） / （R50）		各 12
14	Z6—81	XQ12.Z-02-12	定位螺钉 M12×25		2
15	Z6—72	XQ6B.Z-01-9	开口齿轮		1

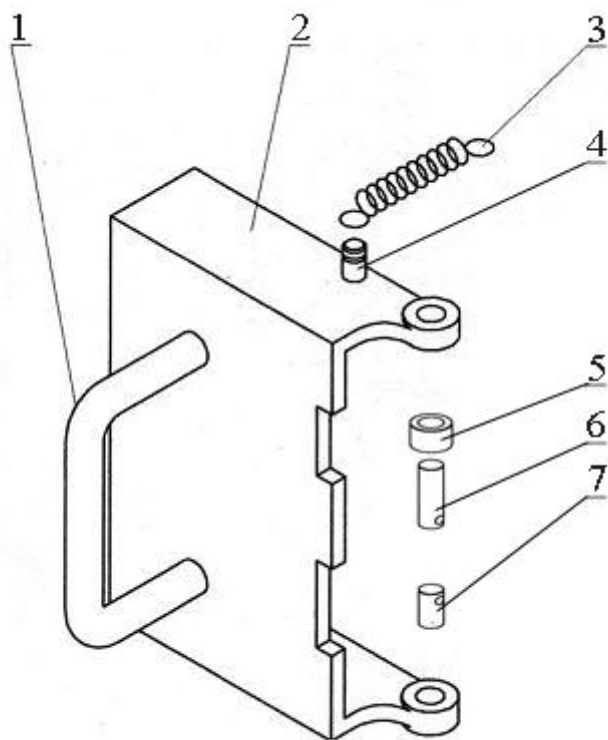


图 2 安全门总成

序号	采购代号	代 号	名称及规格	数量
1	Z6—18	XQ6B.Z-M-4	安全门把手	1
2	Z6—120	XQ6B.Z-M-5	安全门	1
3	Z6—124	18 型自行车拉簧	拉簧	1
4	Z6—121	XQ6B.Z-M-2	拉簧轴	1
5	Z6—122	XQ6B.Z-M-3	套	1
6	Z6—123	XQ6B.Z-M-1	门轴（上）	1
7	Z6—119	XQ6B.Z-M-6	门轴（下）	1

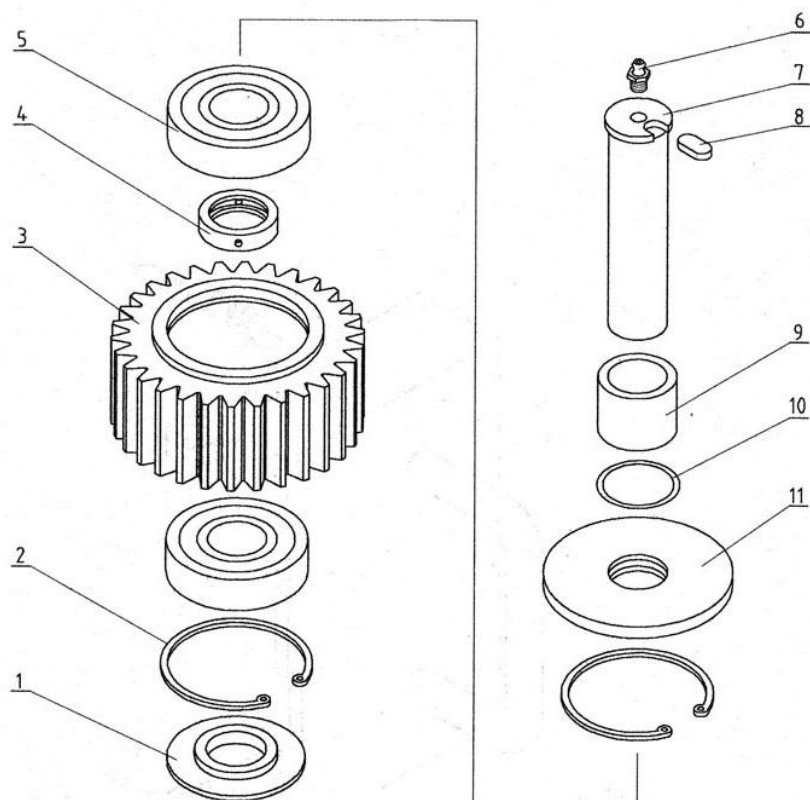


图 3 介轮总成

序号	采购代号	代 号	名称及规格	数量
1	Z6—104	XQ6B.Z-02-7	垫圈	2
2	Z6—102	GB/T893.1-1986	孔用弹性挡圈 72	4
3	Z6—105	XQ6B.Z-02-6	介轮	2
4	Z6—101	XQ6B.Z-02-4	隔环	2
5	Z6—103	GB/T283-1994	短滚子轴承 NJ306E	4
6	Z6—39	JB/T7940.1-1995	油杯 M8×1	2
7	Z6—97	XQ6B.Z-02-1	介轮轴	2
8	Z6—38	XQ6B.Z-02-5	定位片	2
9	Z6—98	XQ6B.Z-02-2	介轮轴套	2
10	Z6—99	GB/T3452.1-2005	O 型密封圈 $\phi 36 \times 3.5$	2
11	Z6—100	XQ6B.Z-02-3	防水盖	2

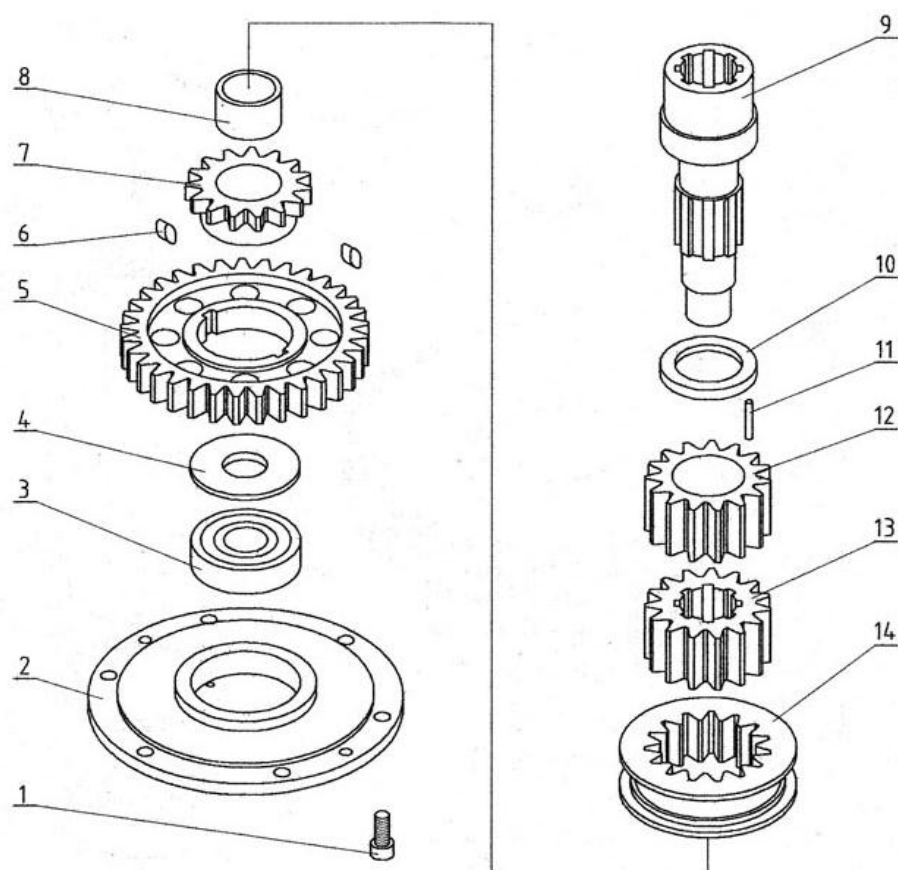


图 4 传动机构（主轴传动部分）

序号	采购代号	代 号	名称及规格	数量
1	Z6—25	GB/T70.1-2000	内六角圆柱头螺钉 M8×20—8.8	6
2	Z6—23	XQ6B.Z-03-13	底盖	1
3	Z6—22	GB/T276-1994	深沟球轴承 6305	1
4	Z6—24	XQ6B.Z-03-12	支承片	1
5	Z6—20	XQ6B.Z-03-11-1	离合器大齿轮	1
6	Z6—20	XQ6B.Z-03-11-2	键	2
7	Z6—20	XQ6B.Z-03-11-3	离合器小齿轮	1
8	Z6—20	GB/T290-1998	冲压外圈滚针轴套 HK3024	1
9	Z6—111	XQ6B.Z-03-5	主轴	1
10	Z6—36	XQ6B.Z-03-6	隔环	1
11	Z6—17	XQ6B.Z-03-8	滚针 $\phi 4 \times 25.8$	55
12	Z6—16	XQ6B.Z-03-7	挂挡齿轮	1
13	Z6—19	XQ6B.Z-03-10	花键齿轮	1
14	Z6—18	XQ6B.Z-03-9	内齿套	1

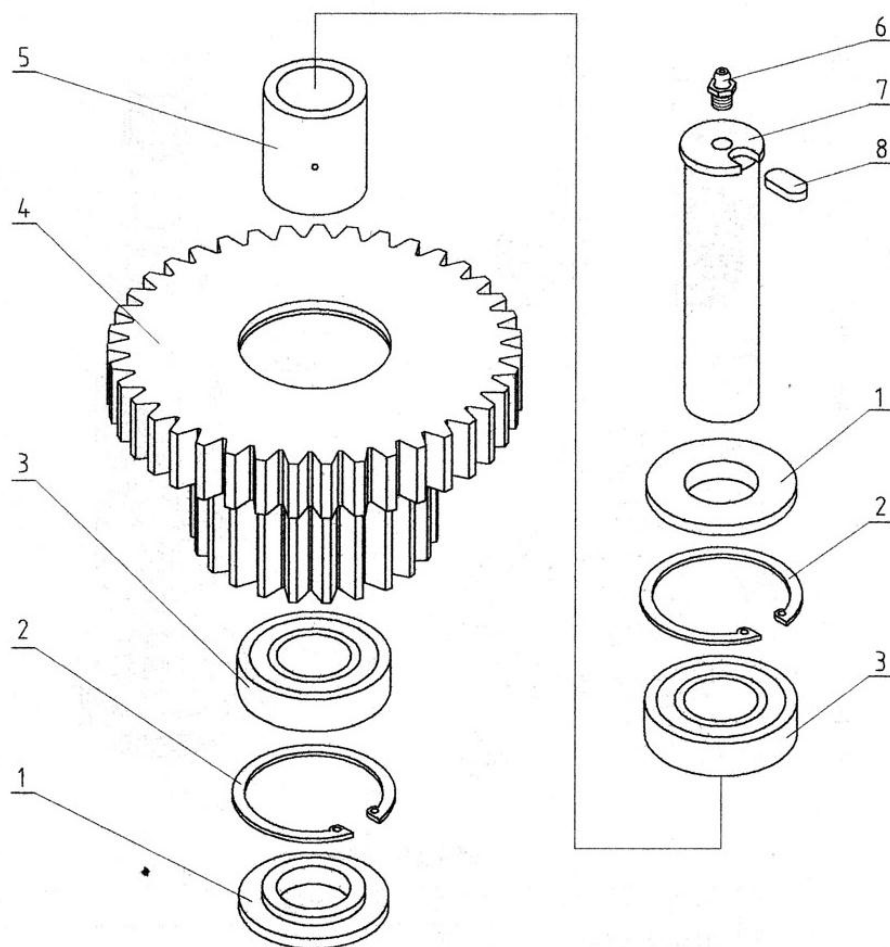


图 5 传动机构（双联齿轮部分）

序号	采购代号	代 号	名称及规格	数量
1	Z6—13	XQ6B.Z-03-2	垫	2
2	Z6—12	GB/T893.1-1986	孔用弹性挡圈 62	2
3	Z6—11	GB/T283-1994	轴承 NJ206E	2
4	Z6—10	XQ6B.Z-03-4	双联齿轮	1
5	Z6—15	XQ6B.Z-03-3	套	1
6	Z6—39	JB/T7940.1-1995	油杯 M8×1	1
7	Z6—14	XQ6B.Z-03-1	双联齿轮芯轴	1
8	Z6—38	XQ6B.Z-02-5	定位片	1

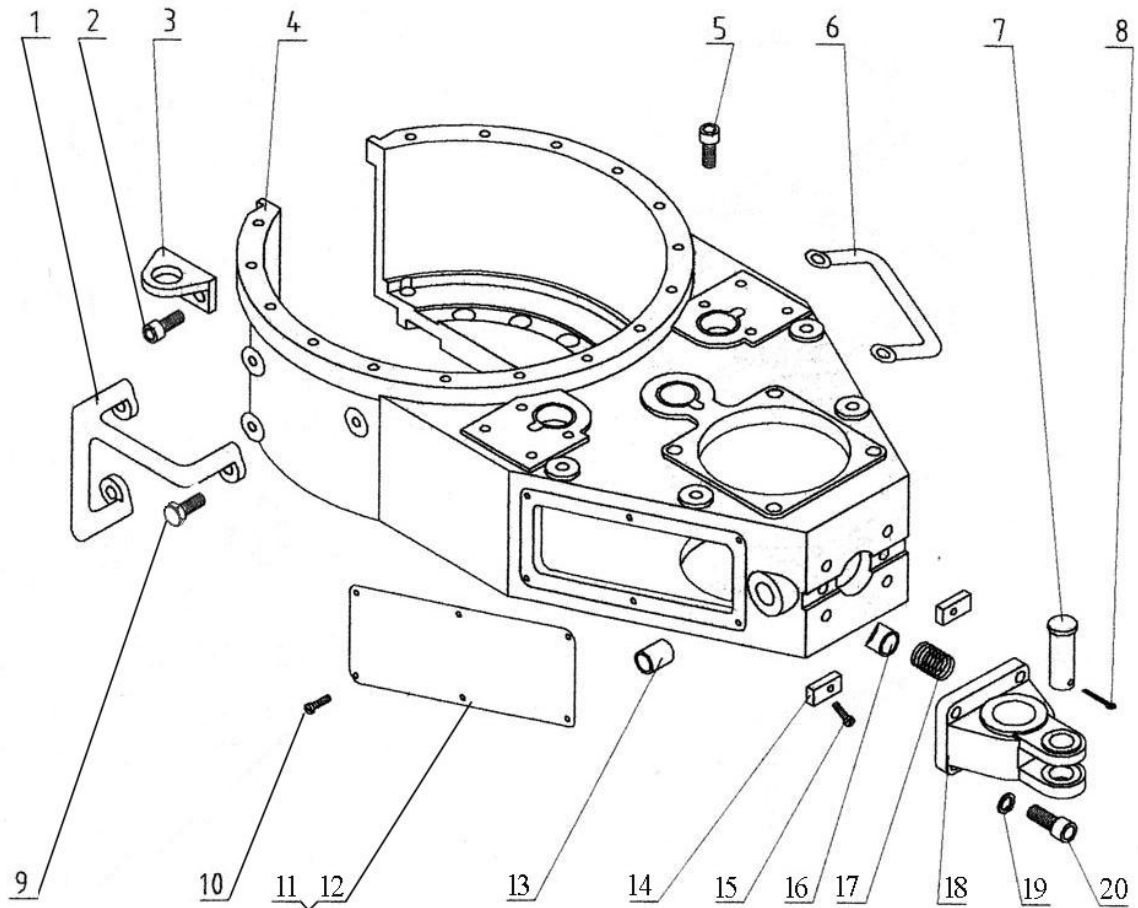


图 6 壳体部件

序号	采购代号	代 号	名称及规格	数量
1	Z6—57	XQ6B.Z-04-3	左/右把手	2
2	Z6—64	GB/T70.1-2000	内六角圆柱头螺钉 M10×20	4
3	Z6—2	XQ6B.Z-04-2	前支座	2
4	Z6—4	XQ6B.Z-04-1	壳体	1
5	Z6—1	GB/T70.1-2000	内六角圆柱头螺钉 M10×20—8.8	15
6	Z6—61	XQ6B.Z-04-11	后把手	2
7	Z6—27	XQ6B.Z-04-6	尾绳销	1
8	Z6—26	GB/T91-2000	开口销 4×30	1
9	Z6—65	GB/T5781-2000	六角头螺栓 M10×20	10

10	Z6—126	GB/T65-2000	开槽圆柱头螺钉 M6×15	12
11	Z6—129	XQ6B.Z-04-12	产品标牌	1
	Z6—130	XQ6B.Z-04-13	扭矩对应牌	1
12	Z6—62	XQ6B.Z-04-10	挡孔板	2
13	Z6—83	XQ6B.Z-04-8	套	2
14	Z6—55	XQ6B.Z-04-9	键	2
15	Z6—56	GB/T68-2000	开槽沉头螺钉 M5×15	2
16	Z6—29	XQ6B.Z-04-5	定位块	1
17	Z6—28	XQ6B.Z-05-3	制动弹簧	1
18	Z6—32	XQ6B.Z-04-4	尾座	1
19	Z6—31	GB/T93-1987	标准型弹性垫圈 12	4
20	Z6—30	GB/T70.1-2000	内六角圆柱头螺钉 M12×40—8.8	4

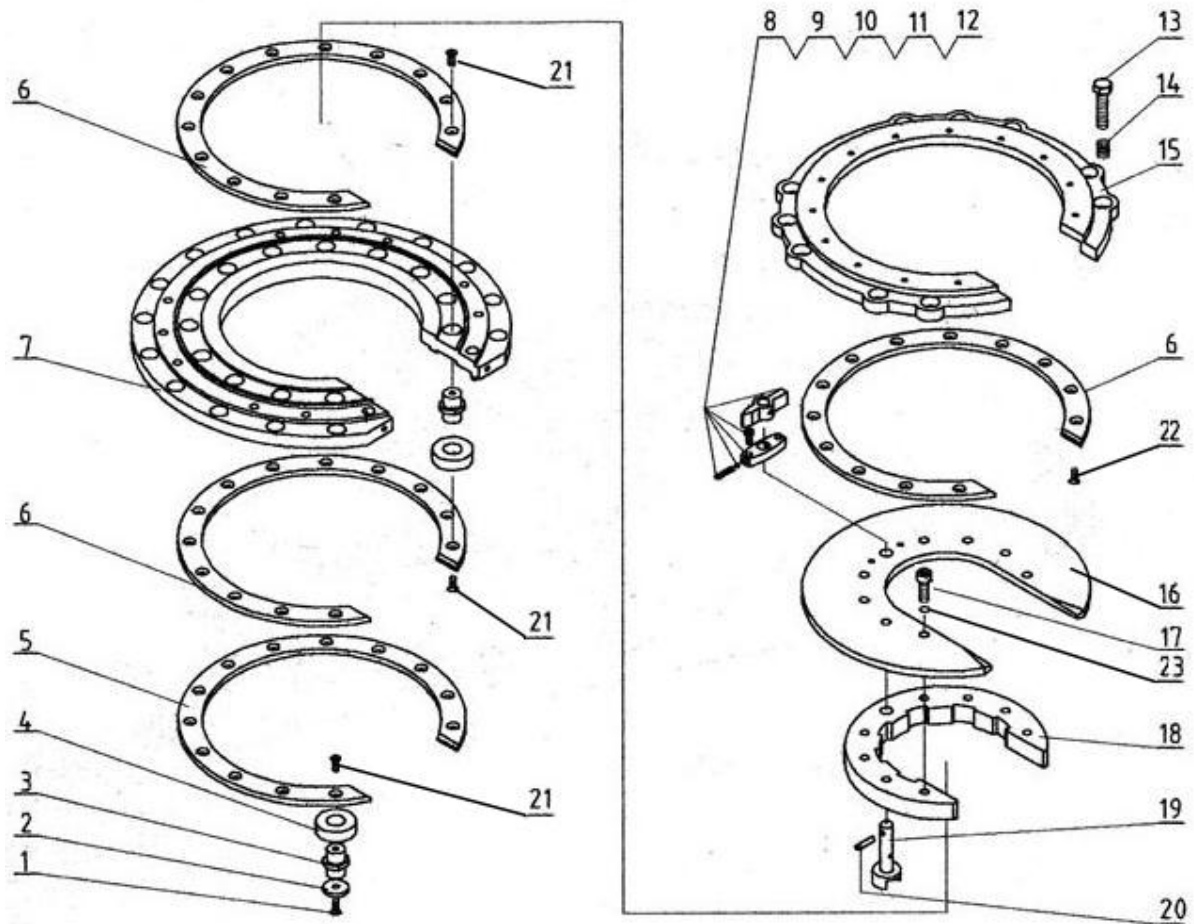


图 7 制动、复位、扶正机构

序号	采购代号	代 号	名称及规格	数量
1	Z6—8	GB/T70.1-2000	内六角圆柱头螺钉 M5×15—8.8	13
2	Z6—9	XQ6B.Z-05-13	垫圈	13
3	Z6—7	XQ6B.Z-05-8	扶正滚子轴	26
4	Z6—5	XQ6B.Z-05-9	扶正滚子	26
5	Z6—6	XQ6B.Z-05-12	摩擦片 B	1
6	Z6—46	XQ6B.Z-05-10	摩擦片 A	3
7	Z6—43	XQ6B.Z-05-5	钳头盖	1
8	Z6—52	XQ12.Z-05-10	小弹簧	2
9	Z6—53	GB/T70.1-2000	内六角圆柱头螺钉 M5×15	2
10	Z6—117	GB308-89	钢球 φ5	2

11	Z6—128	XQ6B.Z-05-6	定位座	1
12	Z6—49	XQ6B.Z-05-1	复位旋钮	1
13	Z6—54	GB/T32.1-1988	六角头头部带孔螺栓 M10×45	10
14	Z6—28	XQ6B.Z-05-3	制动弹簧	10
15	Z6—44	XQ6B.Z-05-4	制动盘	1
16	Z6—48	XQ6B.Z-05-11	制动钢片	1
17	Z6—25	GB/T70.1-2000	内六角圆柱头螺钉 M8×20	8
18	Z6—47	XQ6B.Z-05-7	联接板	1
19	Z6—51	XQ6B.Z-05-2	复位旋钮轴	1
20	Z6—50	GB/T117-2000	圆锥销 5×20	1
21	Z6—21	GB/T819.2-1997	十字槽沉头螺钉 M5×15	39
22	Z6—45	GB/T819.2-1997	十字槽沉头螺钉 M5×10	13
23	Z6—94	GB/T93-87	弹簧垫圈 8	8

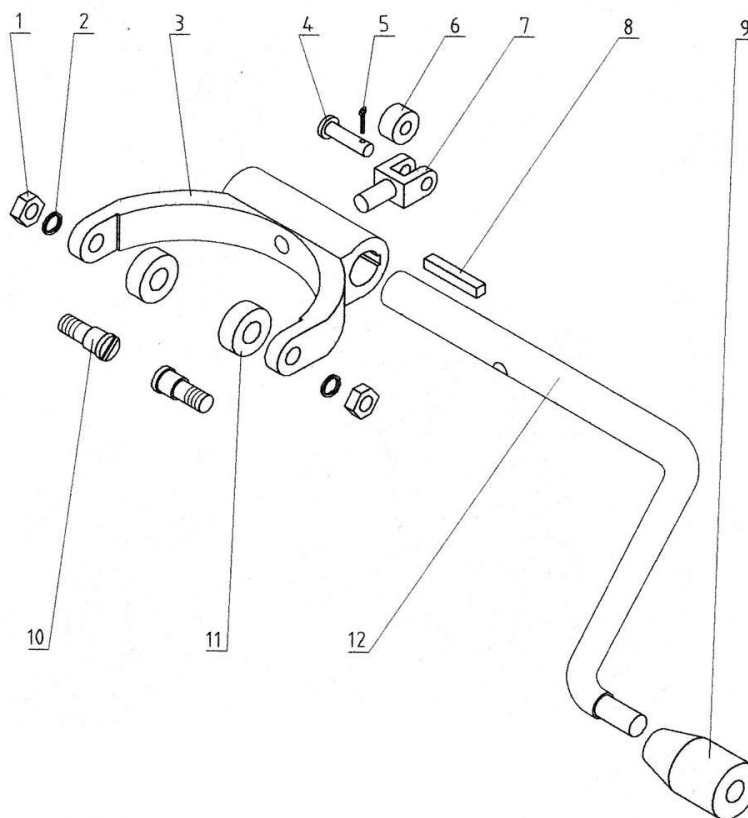


图 8 换挡机构

序号	采购代号	代 号	名称及规格	数量
1	Z6—95	GB/T6170-2000	六角螺母 M8	2
2	Z6—94	GB/T93-1987	标准型弹簧垫圈 8	2
3	Z6—84	XQ6B.Z-06-3	拨叉	1
4	Z6—86	XQ6B.Z-06-7	滚子销轴	1
5	Z6—87	GB/T91-2000	开口销 2×10	1
6	Z6—85	XQ6B.Z-06-9	滚子	1
7	Z6—88	XQ6B.Z-06-8	滚子支座	1
8	Z6—89	GB/T1096-1979	普通平键 A5×30	1
9	Z6—96	XQ6B.Z-06-5	球形手柄	1
10	Z6—92	XQ6B.Z-06-2	滚子轴	2
11	Z6—91	XQ6B.Z-06-1	滚子	2
12	Z6—90	XQ6B.Z-06-4	拨叉轴	1

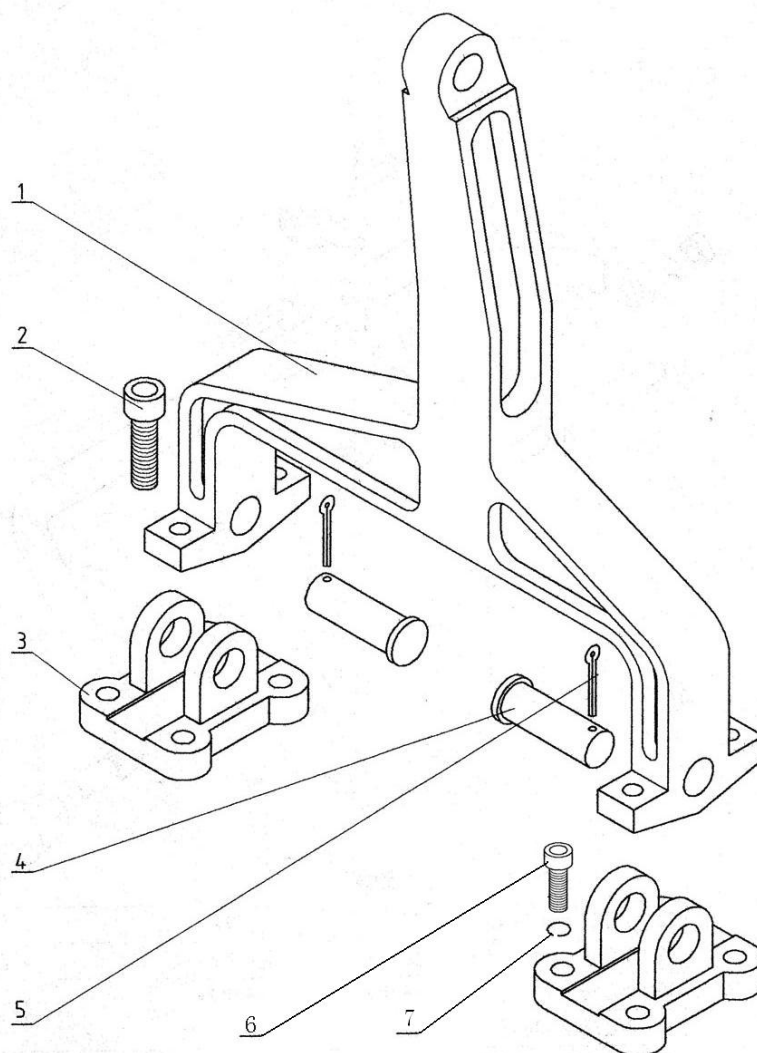


图 9 悬吊杆部件

序号	采购代号	代 号	名称及规格	数量
1	Z6—42	XQ6B.Z-07-1	悬吊杆	1
2	Z6—58	GB/T70.1-2000	内六角圆柱头螺钉 M10×35	4
3	Z6—59	XQ6B.Z-07-3	悬吊杆座	2
4	Z6—41	XQ6B.Z-07-2	销轴	2
5	Z6—40	GB/T91-2000	开口销 3×35	2
6	Z6—128	GB/T70.1-2000	内六角圆柱头螺钉 M8×30	8
7	Z6-94	GB/T93-87	弹簧垫圈 8	8

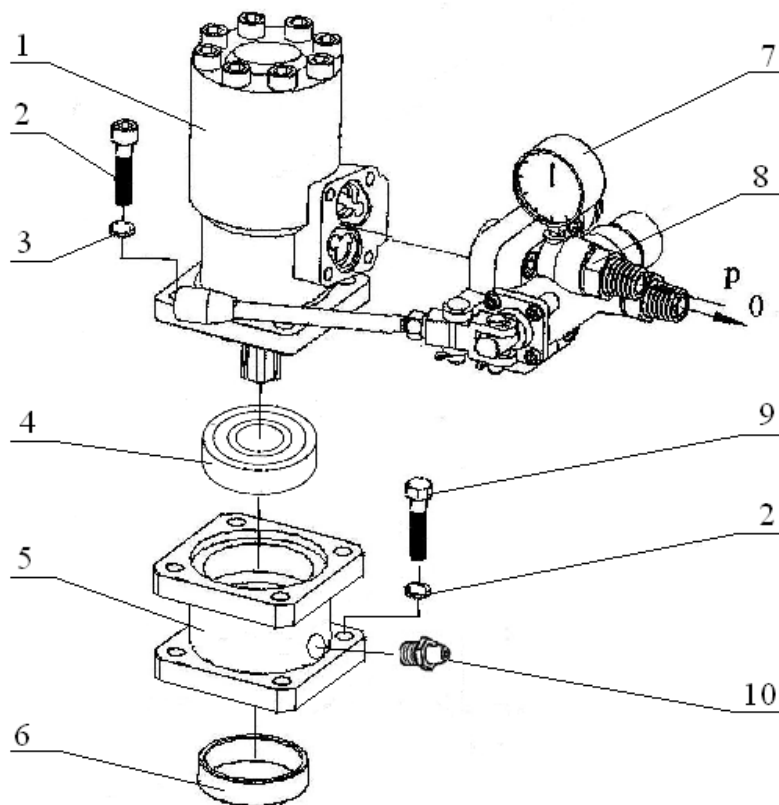


图 10 马达联接座

序号	采购代号	代 号	名称及规格	数量
1	Z6—35		摆线液压马达 BM4-500	1
2	Z6—113	GB/T70.1-2000	内六角圆柱头螺钉 M12×40	4
3	Z6—31	GB/T93-1987	标准型弹簧垫圈 12	8
4	Z6—135	GB/T276-94	深沟球轴承 6130	1

5	Z6—112	XQ6B.Z-08-01	马达联接座	1
6	Z6—114	XQ6B.Z-08-2	马达联接座衬套	1
7	Z6—133	0-16MPa (0-8kN.m)	压力扭矩表 $\phi 60$	选用件 1
8	Z6—33		H 型手动换向阀	1
9	Z6—134	GB/T5781-2000	六角头螺栓 M12×30	4
10	Z6-39	GB7940.1-1995	直通式压注油杯 M8×1	1

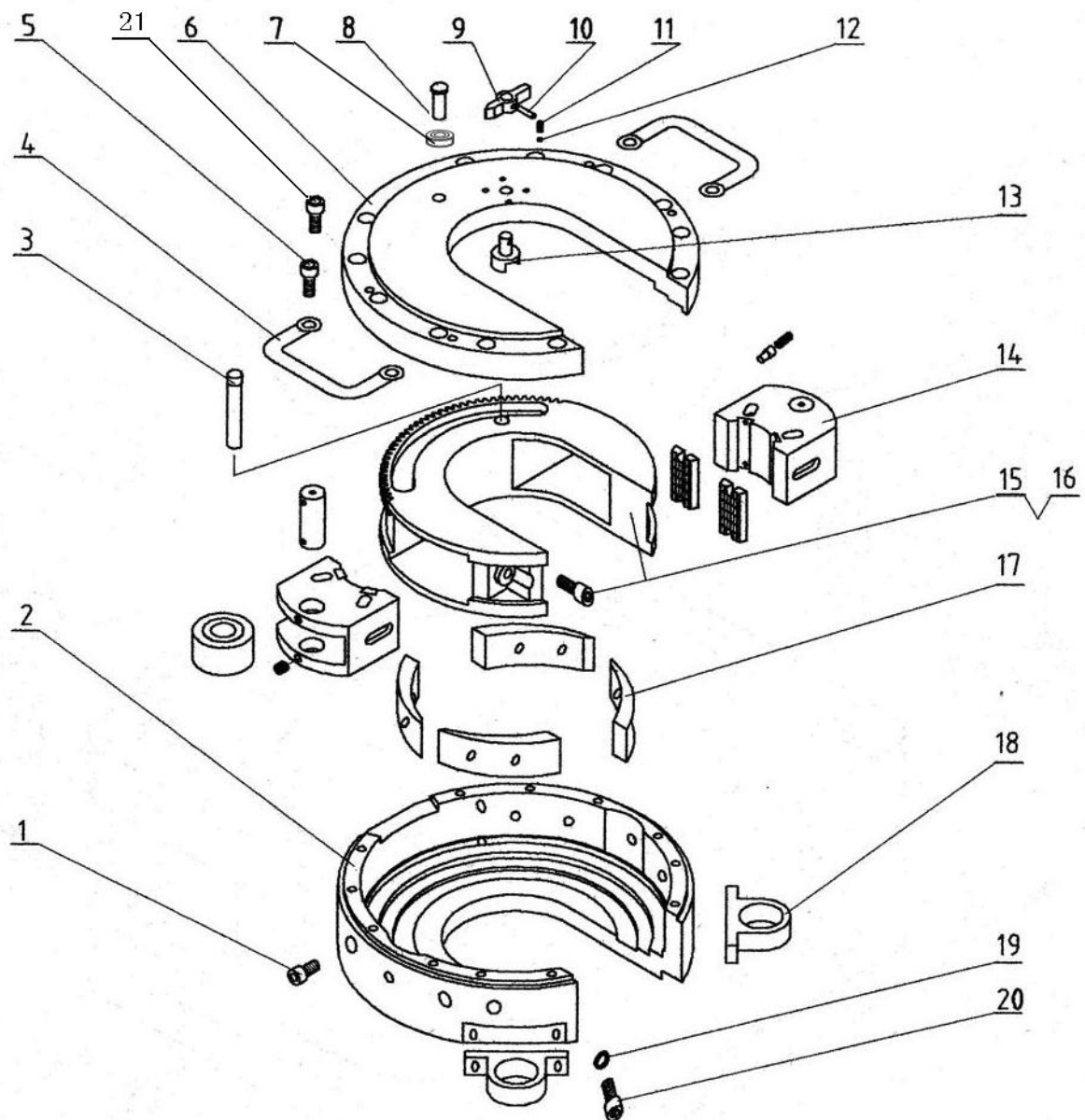


图 11 背钳钳头部分

序号	采购代号	代 号	名称及规格		数量
1	B6—20	GB/T70.1-2000	内六角圆柱头螺钉 M10×20		8
2	B6—7	XQ6B.B-09-3	背钳主体		1
3	B6—5	XQ6B.B-09-5	挡销		1
4	Z6—61	XQ6B.Z-04-11	后把手		2
5	B6—63	GB/T5781-2000	六角头螺栓 M10×20		4
6	B6—1	XQ6B.B-09-11	背钳钳头盖		1
7	B6—19	XQ6B.B-09-7	滚子		1
8	B6—65	XQ6B.B-09-6	销		1
9	B6—3	XQ6B.B-09-9	背钳复位旋钮		1
10	B6—2	GB/T117-2000	圆锥销 5×20		1
11	Z6—52	XQ12.Z-05-10	小弹簧		2
12	B6—17	GB308-89	钢球 φ5		2
13	B6—4	XQ6B.B-09-8	背钳复位旋钮轴		1
14	B6—31	XQ6B.B-09-1A	颞板 93-89	标准配置	2
		XQ6B.B-09-1B	颞板 114.5-107		
		XQ6B.B-09-1C	颞板 141.5-132.5		
		XQ6B.B-09-1D	颞板 63-60	选用件	
		XQ6B.B-09-1E	颞板 73-70		
		XQ6B.B-09-1F	颞板 78-75		
15	Z6—81	XQ12.Z-02-12	定位螺钉 M12×25		2
16	B6—6	XQ6B.B-09-4	背钳颞板架		1
17	B6—24	XQ6B.B-09-2	背钳坡板		4
18	B6—21	XQ6B.B-09-12	背钳主体前支座		2
19	B6—23	GB/T93-1987	标准型弹簧垫圈 12		4
20	B6—22	GB/T70.1-2000	内六角圆柱头螺钉 M12×30		4
21	Z6-30	GB/T70.1-2000	内六角圆柱头螺钉 M10×30		12

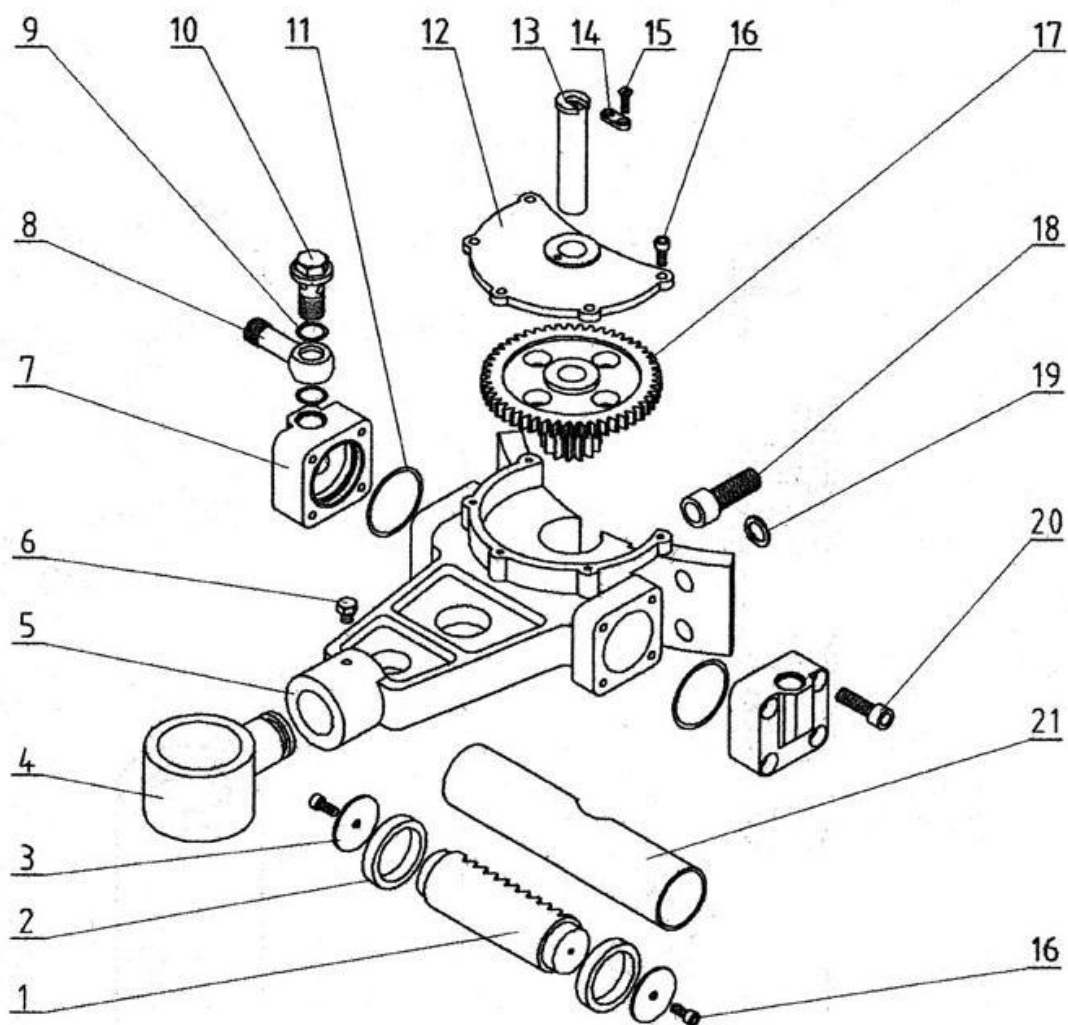


图 12 背钳尾部总成

序号	采购代号	代 号	名称及规格	数量
1	B6—41	XQ6B.B-10-4	齿条柱塞	1
2	B6—39	JB/ZQ4264-1997	YX 密封圈 D45	2
3	B6—40	XQ6B.B-10-9	盖板	2
4	B6—62	XQ6B.B-10-11	背钳钳尾支座	1
5	B6—15	XQ6B.B-10-10	背钳尾座	1
6	B6—18	GB/T70.1-2000	内六角圆柱头螺钉 M8×20	1
7	B6—38	XQ6B.B-10-6	缸盖	2
8	B6—45	XQ6B.B-10-7	接头	2

9	B6—46	GB/T3452.1-2005	O 型密封圈 17×2.65 (22×2.4)	4
10	B6—44	XQ6B.B-10-8	通油螺栓 18×1.5	2
11	B6—36	GB/T3452.1-2005	O 型密封圈 50×2.65	2
12	B6—12	XQ6B.B-10-12	齿轮盖	1
13	B6—8	XQ6B.B-10-2	轴	1
14	B6—9	XQ6B.B-10-3	定位片	1
15	B6—10	GB/T68-2000	内六角圆柱头螺钉 M6×10	1
16	B6—10	GB/T70.1-2000	内六角圆柱头螺钉 M6×16	7
17	B6—11	XQ6B.B-10-1	双联齿轮	1
18	B6—34	GB/T70.1-2000	内六角圆柱头螺钉 M16×40	4
19	B6—33	GB/T93-1987	标准型弹簧垫圈 16	4
20	B6—35	GB/T70.1-2000	内六角圆柱头螺钉 M10×30	8
21	B6—54	XQ6B.B-10-5	缸套	1

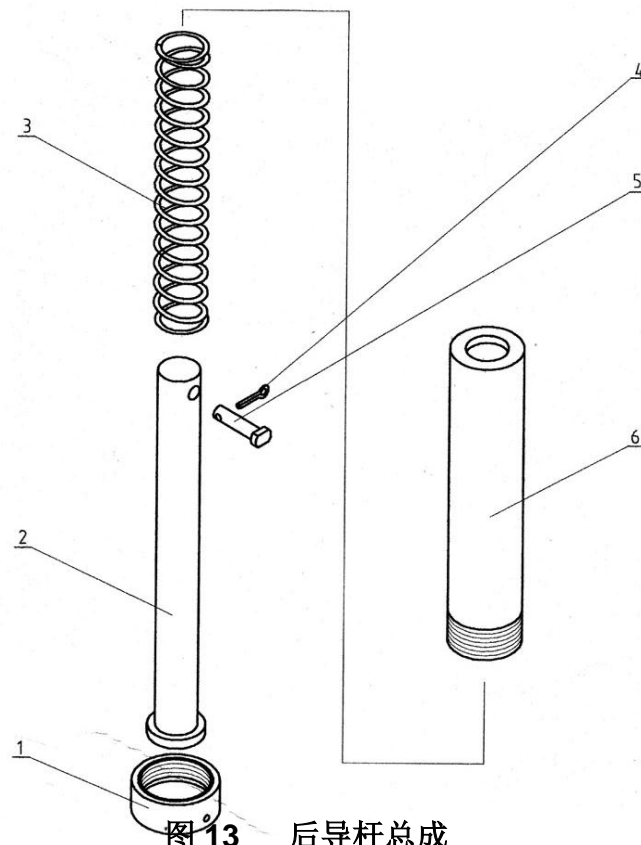


图 13 后导杆总成

序号	采购代号	代 号	名称及规格	数量
1	HD6—1	XQ6B.G-11-5	后导杆座	1
2	HD6—3	XQ6B.G-11-2	后导杆	1
3	HD6—5	XQ6B.G-11-4	弹簧	1
4	HD6—2	GB/T91-2000	开口销 3×20	1
5	HD6—6	XQ6B.G-11-1	销轴	1
6	HD6—4	XQ6B.G-11-3	后导杆套	1

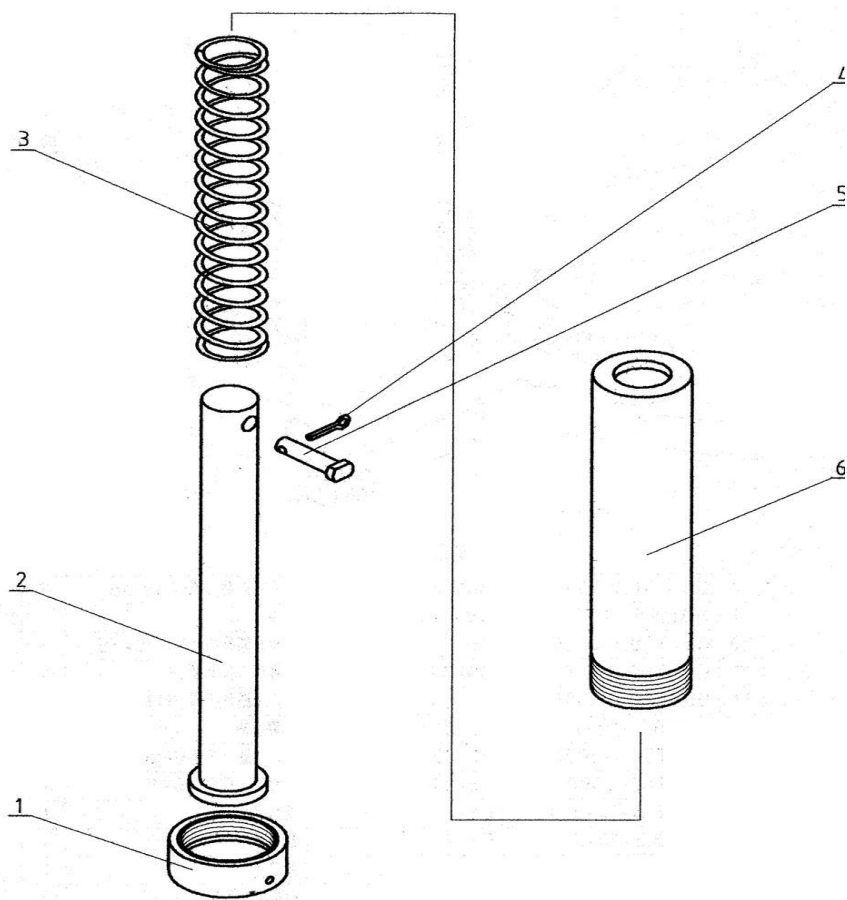


图 14 前导杆总成

序号	采购代号	代 号	名称及规格	数量
1	QD6—1	XQ6B.G-12-5	前导杆座	2
2	QD6—3	XQ6B.G-12-2	前导杆	2
3	QD6—5	XQ6B.G-12-4	弹簧	2
4	QD6—2	GB/T91-2000	开口销 3×20	2

5	QD6—6	XQ6B.G-12-1	销轴	2
6	QD6—4	XQ6B.G-12-3	前导杆套	2

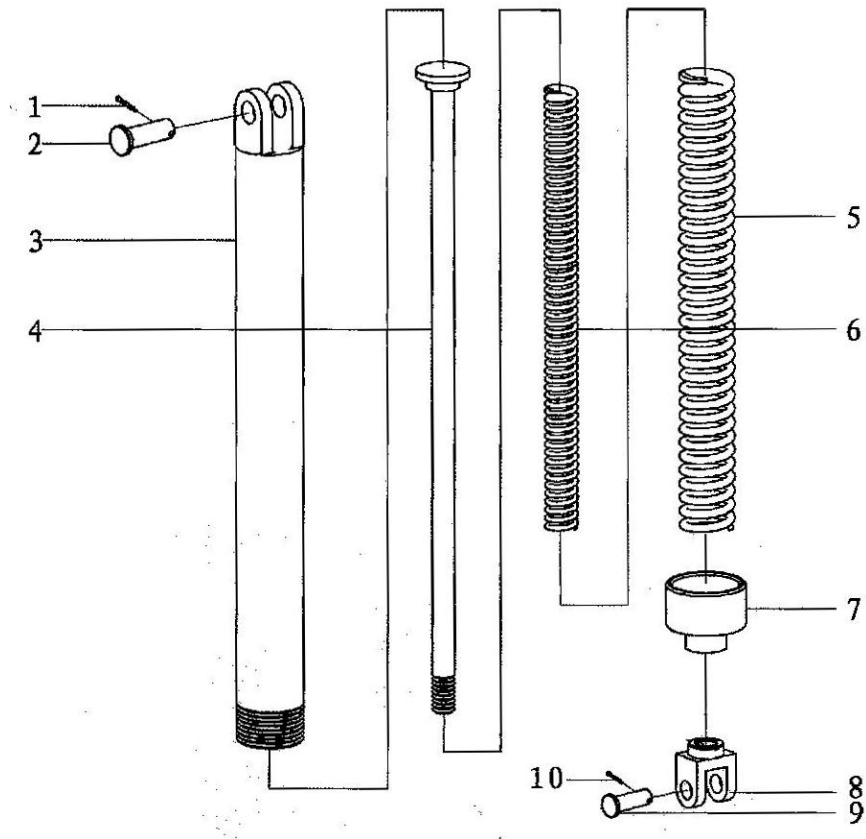


图 15 吊筒总成

序号	采购代号	代 号	名称及规格	数量
1	DT6—10	GB/T91-2000	开口销 4×30	1
2	DT6—9	XQ6B.T-13-7	销轴 (1)	1
3	DT6—7	XQ6B.T-13-3	筒体	1
4	DT6—5	XQ6B.T-13-4	杆 (组件)	1
5	DT6—6	XQ6B.T-13-5	弹簧	1
6	DT6—8	XQ6B.T-13-6	弹簧	1
7	DT6—4	XQ6B.T-13-2	吊筒端盖	1
8	DT6—2	XQ6B.T-13-1	叉头	1
9	DT6—3	XQ6B.T-13-8	销轴 (2)	1
10	DT6—1	GB/T91-2000	开口销 3.2×26	1

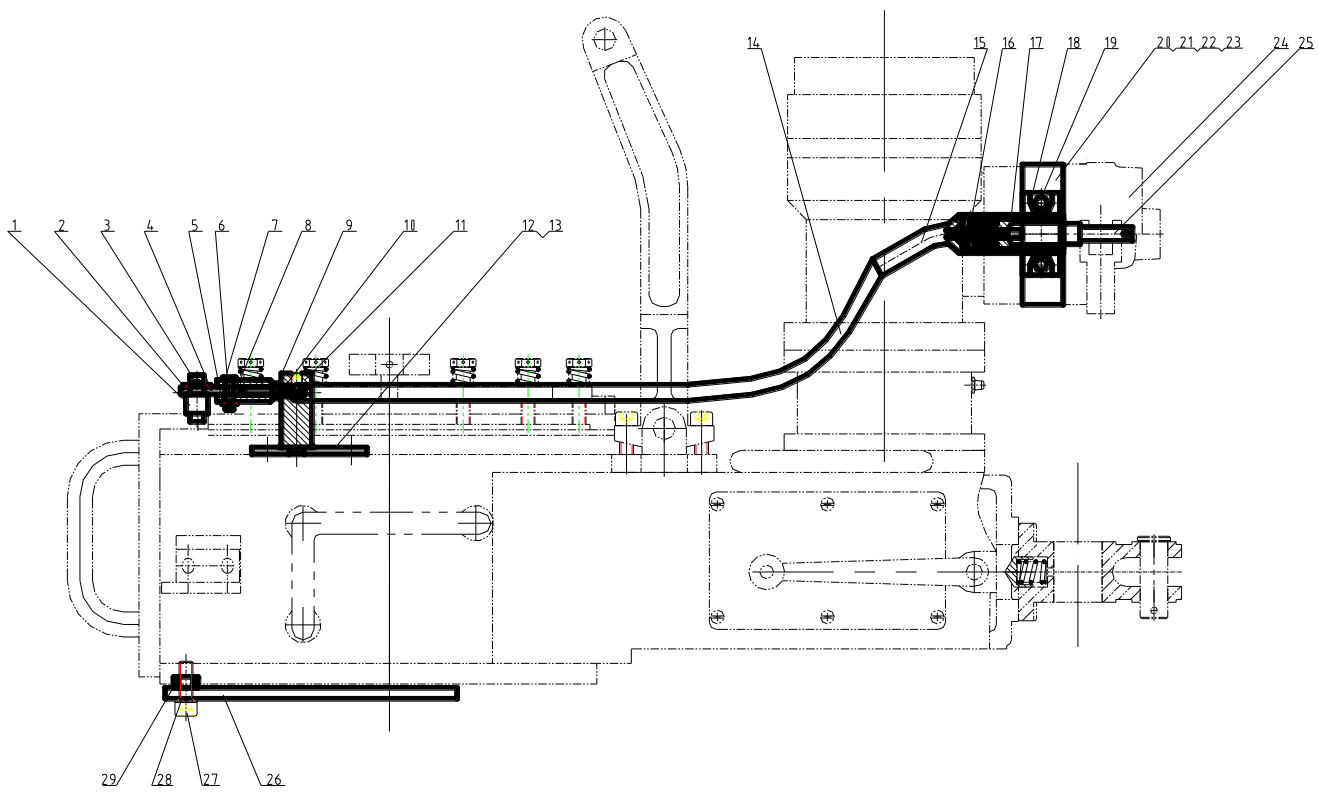


图 16 自锁总成

序号	采购代号	零件图或标准号	零件名称及规格	数量
1	ZS6-1	XQ6B.ZS-01	拉簧销轴	1
2	ZS6-2	GB/T95-2002	平垫圈 10	1
3	ZS6-3	GB/T91-2002	开口销 2.5×16	1
4	ZS6-4	XQ6B.ZS-02	拉片	1
5	ZS6-5	GB/T95-2002	平垫圈 6	1
6	Z6-87	GB/T91-2002	开口销 2×10	1
7	ZS6-7	XQ6B.Z-06-7	滚子轴	1
8	ZS6-8	XQ12.ZS-03	拉片接头	1
9	ZS6-9	GB/T6170-2002	螺母 M6	1
10	ZS6-10	XQ12.ZS-04	接头	1
11	ZS6-11	XQ6B.ZS-04	自锁定位板	1

12	ZS6-12	XQ6B.ZS-05	自锁支架支座	1
13	ZS6-13	GB/T70.1-2000	内六角圆柱头螺钉 M10×30	2
14	ZS6-14	XQ6B.ZS-07	拉线	1
15	ZS6-15	XQ12.ZS-07	自锁支架	1
16	ZS6-16	XQ12.ZS-08	弹簧	1
17	ZS6-17	XQ6B.ZS-06	锁套	1
18	ZS6-18	XQ12.ZS-10	自锁支座	1
19	ZS6-19	GB/T70.1-2000	内六角圆柱头螺钉 M8×15	2
20	ZS6-20	XQ6B.ZS-10	油马达阀板	1
21	Z6-25	GB/T70.1-2000	内六角圆柱头螺钉 M8×20	2
22	Z6-94	GB/T93-87	弹簧垫圈 8	2
23	ZS6-23	GB/T3452.1-2005	O 型密封圈 17×2.65 (22×2.4)	2
24	ZS6-29	GB/T70.1-2000	内六角圆柱头螺钉 M12×60	4
25	ZS6-24	XQ12.ZS-11	销子	1
26	ZS6-28	XQ6B.ZS-08	推板	1
27	B6-20	GB/T70.1-2000	内六角圆柱头螺钉 M10×20	2
28	ZS6-26	GB/T93-87	弹簧垫圈 10	2
29	ZS6-25	XQ6B.ZS-03	自锁衬套	2

MODEL XQ114/6YB WORKOVER POWER TONG

OPERATION MANUAL



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NOTES

1. Operators must be familiar with the operation manual to know the structural performance, operating principles and process of the power tong. They also need to know the function, installation and maintain of all kinds of operating handle.
2. Operators must wear working garments, and no stacking sundries are placed nearby the power tongs.
3. Operators must check the connection of suspension assembly, balance rope connection, spring bucket and hydraulic pipeline before working.
4. Operators must operate the product at the side of the tong side and close the safety door when making up or braking out the pipes, stop closing to the rotating part when the power tongs are working.
5. Please operate the reversing reset rotary knob of master tong and backup tong according to the tags so as not to operate wrongly while making up and breaking out.
6. Please move the power tong far away from the well and turn off the hydraulic power when maintaining or replacing parts such as jaw sets, die sets, dies.
7. Stop using power tongs when it is overpressure, over torque, stop dismantling or adding the parts willfully.
- 8. Please use parts from manufacturer for the power tong' working normally.**

1. Summary

Model XQ114/6YB is a type of medium-sized power tong for well servicing, widely applied in making up and breaking out tubing thread in oil-field well repairing.

This product has following features:

1. New type of hydraulic backup tong is matched with the master tong to form the combined tong, and the backup tong can clamp and release the pipe freely and reliably while operating the manual reversing valve on the master tong.
2. Different size of jaws on the master and backup tong are replaced so as to clamp different specification of pipe and coupling, and the jaws are installed and disassembled conveniently.
3. Big speed differences between gears provide high speed at the high gear and big torque at the low gear.
4. The brake mechanism and direction control mechanism of the tong head at the upper of the tong head is reliable at the aspect of the performance, and installation, adjustment and maintenance are convenient.
5. Master tong is suspended, and backup tong is floated under the master tong, the backup tong hose is connected with the master tong through joints. The master tong and backup tong are combined to use easily and released conveniently.
6. Torque controlling system can be chosen to show, record and control make-out torque.

2. Specification

1. Applicable Range	$\Phi 60 \sim \Phi 114$ mm ($2\frac{3}{8}'' \sim 4\frac{1}{2}''$)
2. Max. High Gear Torque	1.5kN.m (1106lbf.ft)
3. Max. Low Gear Torque	6.0kN.m (4425lbf.ft)
4. Max. High Gear Speed	85r/min
5. Max. Low Gear Speed	20r/min
6. Rated system pressure:	12Mpa (1740psi)
7. Max. oil supply mass:	100L/min (26.42gpm)
8. Opening size	118mm (4.65in)
9. Weight	260kg (573lb)
10. Outside dimension of power tong:	850×500×600 mm (33.5×19.7×26 in)

3. Installation

1. Connect the bucket with the suspension rod of master tong (Z6-42), and suspend the power tong on the mast of the workover. And the suspension point is 15m above away from the wellhead. Under the free suspension condition, the head center of the power tong is about 0.5m far away from the wellhead. The suspension height is suitable when the backup tong is clamped with coupling of oil tube properly
2. Leveling. Adjust the screw on the suspension rod (Z6-42) to level the power tong. If it is not leveled, the clamping shall fail.
3. Connect with balance rope. One end of the balance rope is connected on the mast, and the other end is connected on the tailstock (Z6-32) of the power tong. And the balance rope can bear the tensile force of 20kN. When the power tong is in the make-up condition, the balance rope is vertical with the power tong to ensure safety of the operator at the side of operating handle.
4. Switch on the hydraulic power. Connect the HP hose of the hydraulic source, connect the oil supply hose with the upper oil port of the manual reversing valve, and connect the oil return hose with the lower oil port of the manual reversing valve. Pay attention not to connect in wrong position.

4. Hydraulic system

Fig.1 is the figure of hydraulic principle of power tong:

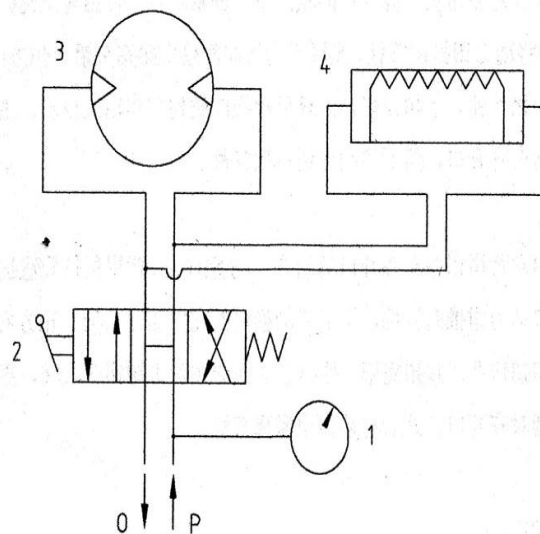


Fig.1

1. Pressure torque gauge displays both system pressure and torque. (Options)
2. Manual reversing valve controls master tong motor, backup tong cylinder linkage and makeup and breakout operation.
3. Hydraulic motor drives the head of master tong to rotate and clamps pipe string.
4. Backup tong cylinder drives the backup tong to rotate clockwise and anticlockwise and clamps coupling as well.

5. Operation

(1). Change jaws:

Jaws of master tong and backup tong can be put into and taken out from the space of tong center freely. Fixing screws (Z6—81) , (B6—25) are installed on both sides of jaw bracket openings of master tong and backup tong to stop jaws from falling off during working and moving (Z6—79) , (B6—31) . Loosen the fixing screws (Z6—81) , (B6—25) and then jaws can be taken out from the tong head center freely. Sizes stamped on jaws should be consistent with the OD of the pipe strings.

(2). Shifting

Operate the manual reversing valve (Z6—33) , the high gear is available when pushing down the shift fork shaft (Z6—90) and low gear is available when uplifting the shift fork shaft (Z6—90). The shifting operation must be taken at lower speed to avoid any damage to the gear.

(3). Operation of makeup and breakout

Makeup:

After aligning the openings of the master and backup tong head, turn reset knobs (Z6-49), (B6-3) to the direction of makeup. Move the power tong to the pipe string. Operate the manual reversing valve (Z6-33) to make the master tong rotate along the make-up direction to realize the make-up operation. After making up, operate the manual reversing valve (Z6-33) to make the master tong rotate reversely. The tong heads of master tong and backup tong should be aligned with openings respectively, and then the power tong is moved away from the pipe to complete the makeup.

Breakout:

After aligning the openings with tong heads of the master and backup tong, turn reset knobs (Z6-49), (B6-3) to the breakout direction. Move the power tong to the pipe string. Operate the manual reversing valve (Z6-33) to make the master tong rotate along the break-out direction. After breaking out, operate the manual reversing valve (Z6-33) to make the master tong rotate reversely. The tong heads of master tong and backup tong should be aligned with openings respectively, and then the power tong is moved away from the pipe to complete the breakout.

(4). Change tong dies

Push screw driver into tong-die retaining pin (Z6—74) of jaws to take out tong dies.

Two types of dies are offered for XQ114/6YB hydraulic power tong, namely 89-141.5mm (3 ½"-4 ½") and 60-78mm (2 3/8"-3"), to be applied on pipe strings of different sizes. Die sizes are stamped on the backside of each die.

Select different dies in accordance with the stamped sizes on the back of the jaws suitable for different pipe OD when changing.

6. Maintenance and Lubrication

- (1). After transporting every time, clean tong heads with kerosene or diesel oil and fill grease into each grease nipple of the tong.
- (2). After cleaning tong heads, grease jaws, jaw brackets and cotter gears.
- (3). If the jaws do not hold out due to insufficient braking force, adjust the braking bolts slightly to increase the brake pressure, tighten each bolt with hole (Z6-54) slightly. Be sure not to screw too much or friction discs will be over-heated.
- (4). After used every time, check the tong body, clean it in time if any water or dirt accumulated inside.
- (5). Lubricate each rotational pin shaft after used the well every time.
- (6). Don't clean the tongs with steam to avoid damage the bearing because of oil losing or water penetration.
- (7). Temperature of the hydraulic oil shouldn't be over 65℃, and the hydraulic system will not be sealed if it's too hot.
- (8). Hydraulic oil must be clean and ensure that oil filter works normally, replace it at once if

the oil is dirty.

(9). Choice for hydraulic oil:

- a. YC—N46 low-freezing hydraulic oil , range of temperature is $-20^{\circ}\text{C} \sim +40^{\circ}\text{C}$;
- b. YB—N46 anti-wear hydraulic oil, range of temperature is $-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$;
- c. YA—N46 common hydraulic oil, range of temperature is $0^{\circ}\text{C} \sim +40^{\circ}\text{C}$.

7. Common Troubles and Solution

Common troubles	Cause	Solution
Tong dies slippage	Jaws are improperly selected.	Select suitable jaws (Z6-79) (B6-31)
	The die groove is filled with hard contaminants.	Get rid of the contaminants
	Dies are over worn.	Replace new dies
	The brake moment of tong head is a little small.	Tighten brake spring (Z6-28) to a proper extent.
	Tong body is not level.	Level tong body (master and backup tong)
Tong head of master tong or backup tong doesn't align with the opening.	Retaining pins (Z6-69) (B6-5) are not wrapped by reset knob.	Turn reset knobs (Z6-49), (B6-3)180°, then reset.
Backup tong slips while master tong works well.	Backup tong jaw bracket rotates in the direction opposite to the rotation of master tong.	Exchange the position of two hoses of backup tong.
Engaging a gear unstably makes the gear easy to drop off	Locking strength is not strong enough.	Add adjusting padding and increase the pressure of spring (Z6-28).

8. Recommended list for choice of jaws and dies

(1) Size of jaws

Tubing		Master tong		Backup tong		
Metric system	British system	Jaw (steel mark)	Die (steel mark)	Jaw (steel mark)	Die (steel mark)	Clamped position
φ60	2 3/8"	60-56 (option)	60-78 (R35)	63-60	60-78 (R35)	Body
				73-70		Coupling

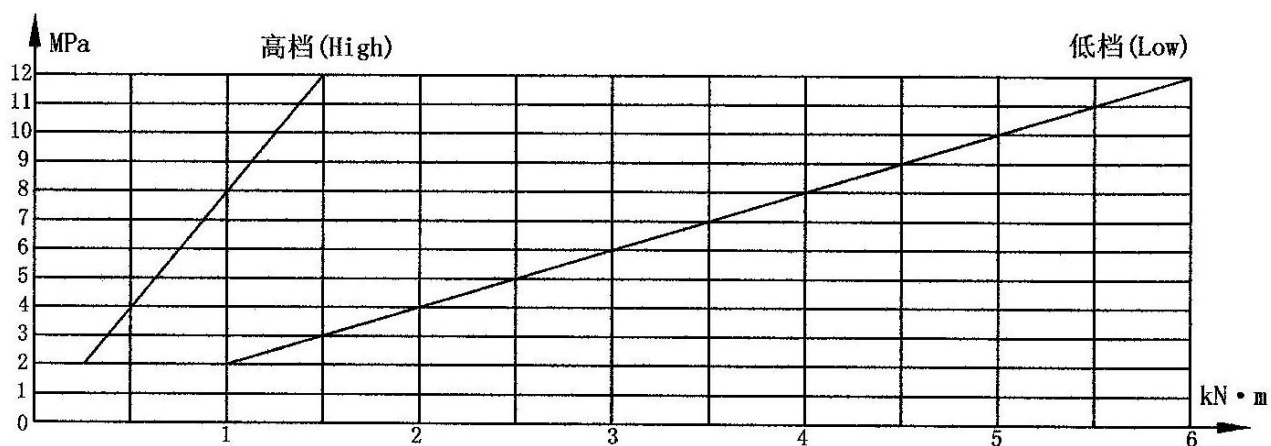
				78-75			Thickened coupling
φ73	2 7/8"	73-69		73-70			Body
				93-89			Coupling
φ89	3 1/2"	89-85	89-142 (R50)	93-89	89-142 (R50)	Body	
				114.5-107		Coupling	
φ105 small drill pipe		105 (option)		114.5-107		Small drill pipe	
φ114	4 1/2"	114-110				Body	
				141.5-132.5		Coupling	

Note: Orders can be made according to customer's requirements.

(2) Size of dies

Size of tubing	Dies for master tong and backup tong	
	Purchase no.	Mark
60-73	Z6-73 (A)	60-78
89-114	Z6-73 (B)	89-142

9. Corresponding table for pressure and torque



10. Accessories and parts list

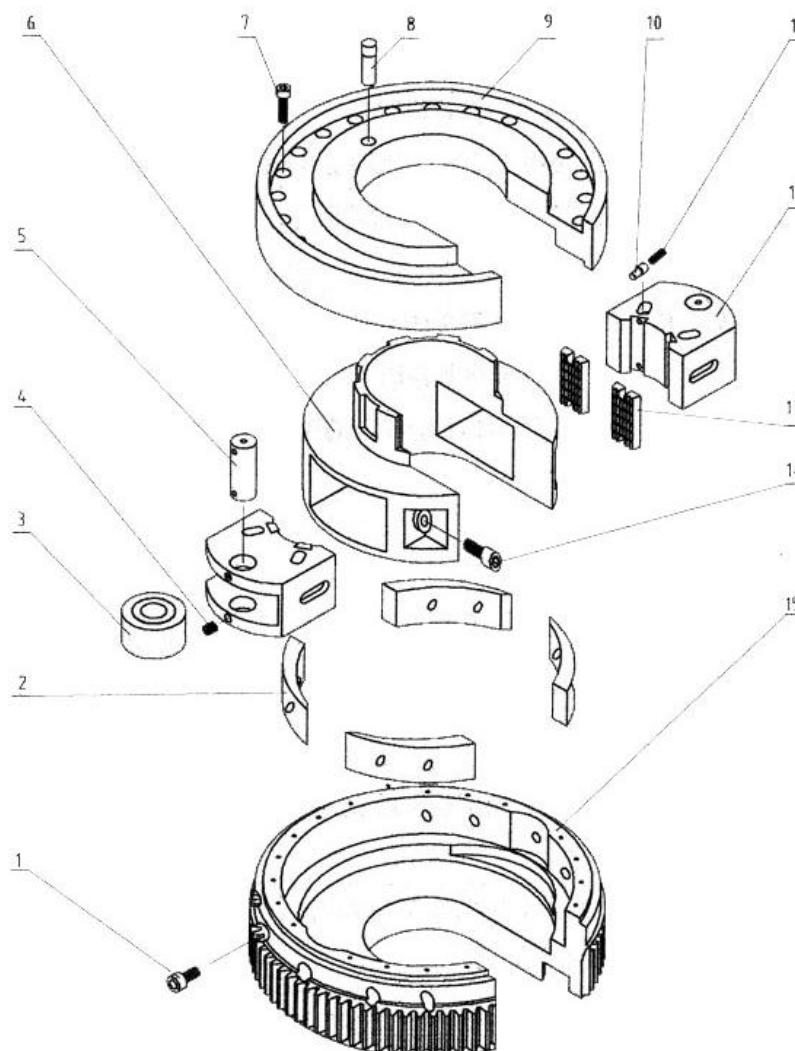


Fig.1 Master Tong Head Assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—1	GB/T70.1-2000	Hexagon socket head cap screw M10×20-8.8	8
2	Z6—80	XQ6B.Z-01-10	Ramp	4
3	Z6—78	XQ6B.Z-01-1	Roller	2
4	Z6—77	GB/T71-1985	Slotted set screw with cone point M10×10	16
5	Z6—76	XQ6B.Z-01-2	Roller shaft	2
6	Z6—71	XQ6B.Z-01-11	Master tong jaw bracket	1
7	Z6—68	GB/T70.1-2000	Hexagon socket head cap screw M8×30	19
8	Z6—69	XQ6B.Z-01-7	Retaining pin	1
9	Z6—70	XQ6B.Z-01-8	Cotter gear cover	1
10	Z6—74	XQ6B.Z-01-4	Die retaining pin	24

11	Z6—75	XQ6B.Z-01-3	Spring		24
12	Z6—79	XQ6B.Z-01-5A	Jaw 73-69	Standard Layout	Each 2
		XQ6B.Z-01-5B	Jaw 89-85		
		XQ6B.Z-01-5C	Jaw 114-110		
		XQ6B.Z-01-5D	Jaw 60-56	Options	
		XQ6B.Z-01-5E	Jaw 105		
13	Z6—73	XQ6B.Z-01-6	Die(R35,R50)		Each 12
14	Z6—81	XQ12.Z-02-12	Fixing screw M12×25		2
15	Z6—72	XQ6B.Z-01-9	Open gear		1

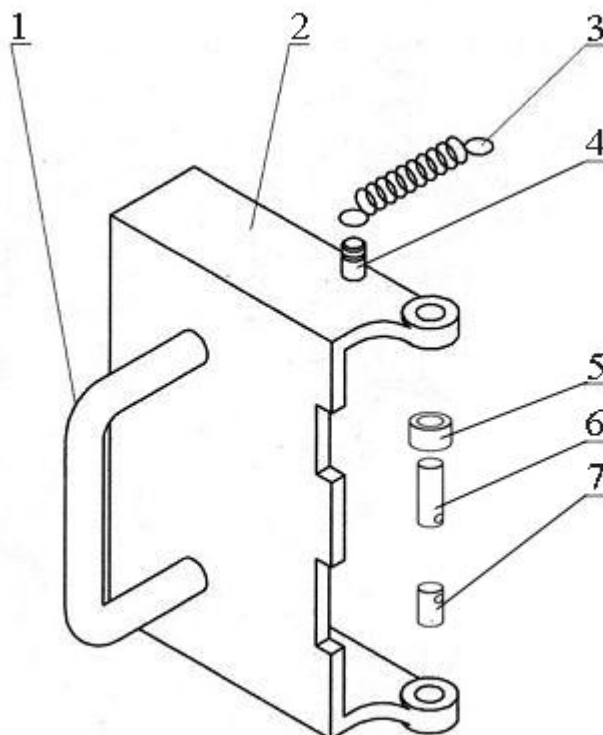


Fig.2 Safety Door Assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—18	XQ6B.Z-M-4	Safety door handle	1
2	Z6—120	XQ6B.Z-M-5	Safety door	1
3	Z6—124	Size 18 bicycle spring	Tension spring	1
4	Z6—121	XQ6B.Z-M-2	Tension spring shaft	1
5	Z6—122	XQ6B.Z-M-3	Sleeve	1
6	Z6—123	XQ6B.Z-M-1	Door shaft(upper)	1
7	Z6—119	XQ6B.Z-M-6	Door shaft(below)	1

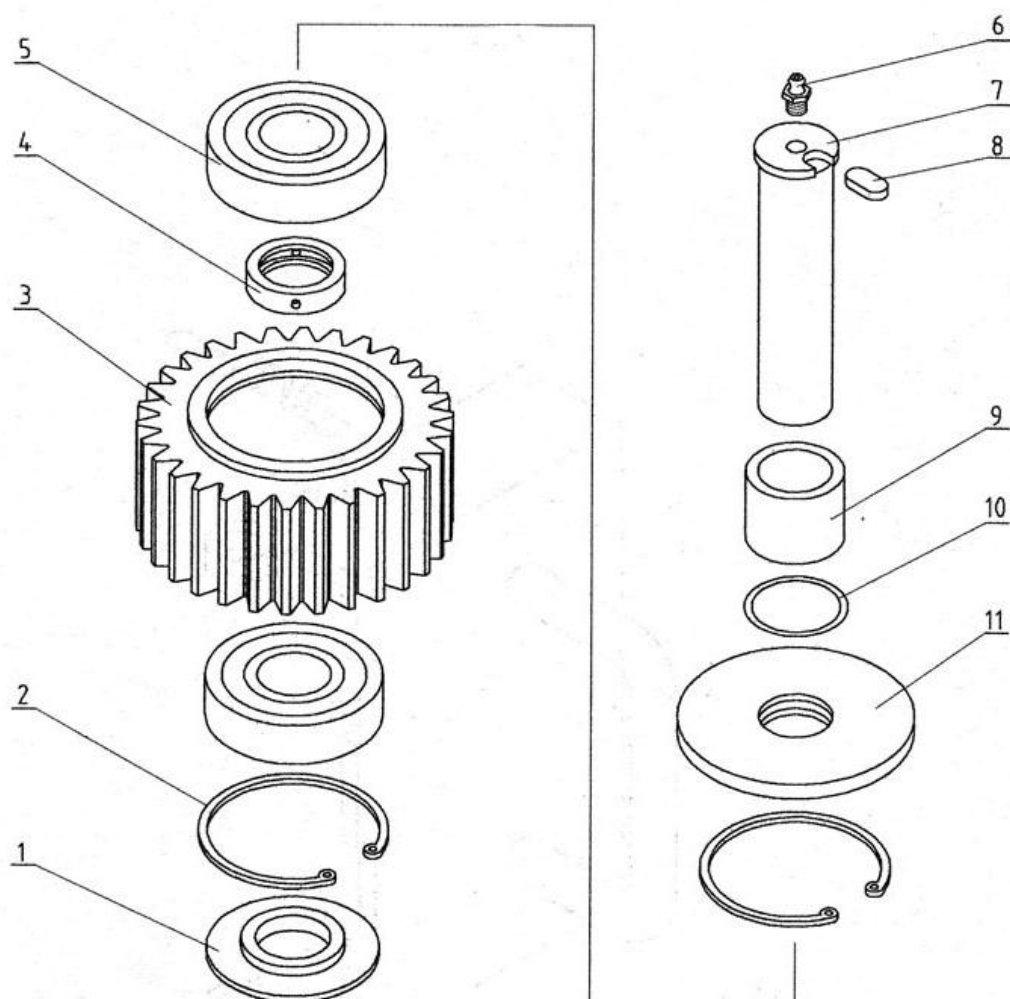


Fig.3 intermediate wheel assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—104	XQ6B.Z-02-7	Washer	2
2	Z6—102	GB/T893.1-1986	Circlip for hole 72	4
3	Z6—105	XQ6B.Z-02-6	Intermediate wheel	2
4	Z6—101	XQ6B.Z-02-4	Spacer	2
5	Z6—103	GB/T283-1994	Short roller bearing NJ306	4
6	Z6—39	JB/T7940.1-1995	Grease nipple M8*1	2
7	Z6—97	XQ6B.Z-02-1	Intermediate wheel shaft	2
8	Z6—38	XQ6B.Z-02-5	Locating plate	2
9	Z6—98	XQ6B.Z-02-2	Intermediate wheel shaft sleeve	2
10	Z6—99	GB1235-76	O-ring seal Φ36×3.5	2
11	Z6—100	XQ6B.Z-02-3	Waterproof guard	2

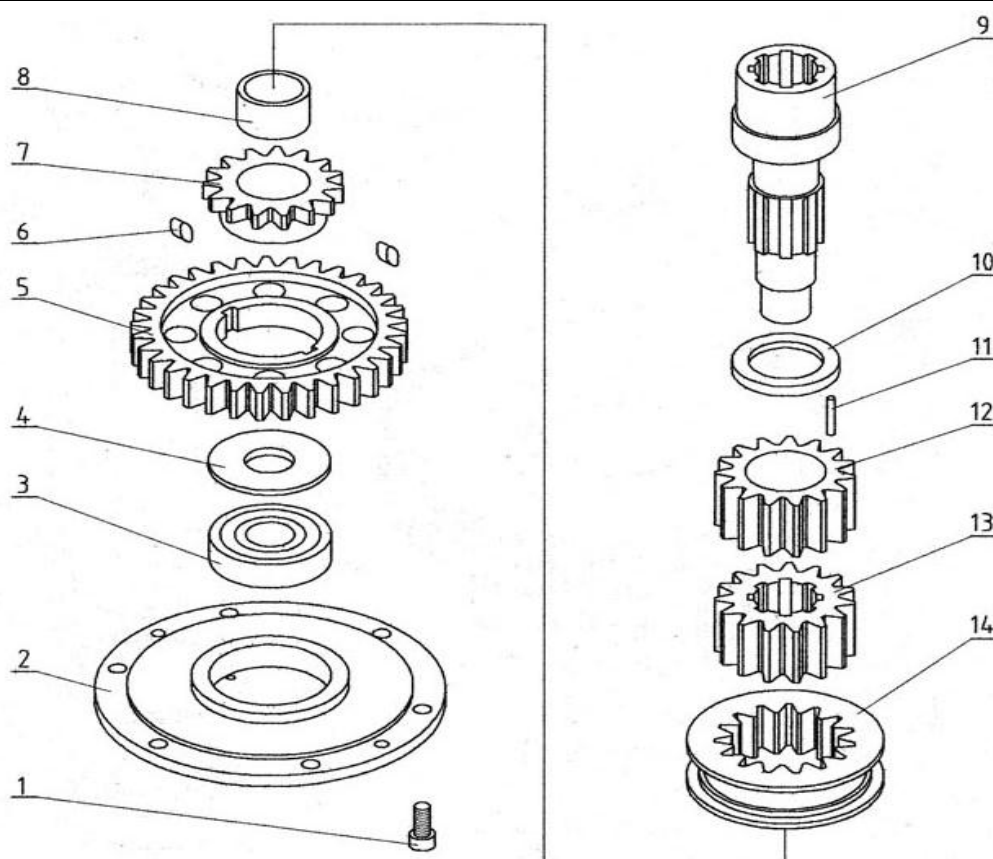


Fig.4 Drive mechanism (Main shaft)

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—25	GB/T70.1-2000	Hexagon socket head cap screw M 8×20-8.8	6
2	Z6—23	XQ6B.Z-03-13	Bottom cover	1
3	Z6—22	GB/T276-1994	Deep groove ball bearing 6305	1
4	Z6—24	XQ6B.Z-03-12	Supporting plate	1
5	Z6—20	XQ6B.Z-03-11-1	Big gear wheel of clutch	1
6	Z6—20	XQ6B.Z-03-11-2	Key	2
7	Z6—20	XQ6B.Z-03-11-3	Pinion of clutch	1
8	Z6—20	GB/T290-1998	Pressing needle roller shaft sleeve HK3024	1
9	Z6—111	XQ6B.Z-03-5	Main shaft	1
10	Z6—36	XQ6B.Z-03-6	Spacer	1
11	Z6—17	XQ6B.Z-03-8	Roller pin $\phi 4 \times 25.8$	55
12	Z6—16	XQ6B.Z-03-7	Shifting gear	1
13	Z6—19	XQ6B.Z-03-10	Spline gear	1
14	Z6—18	XQ6B.Z-03-9	Inner gear sleeve	1

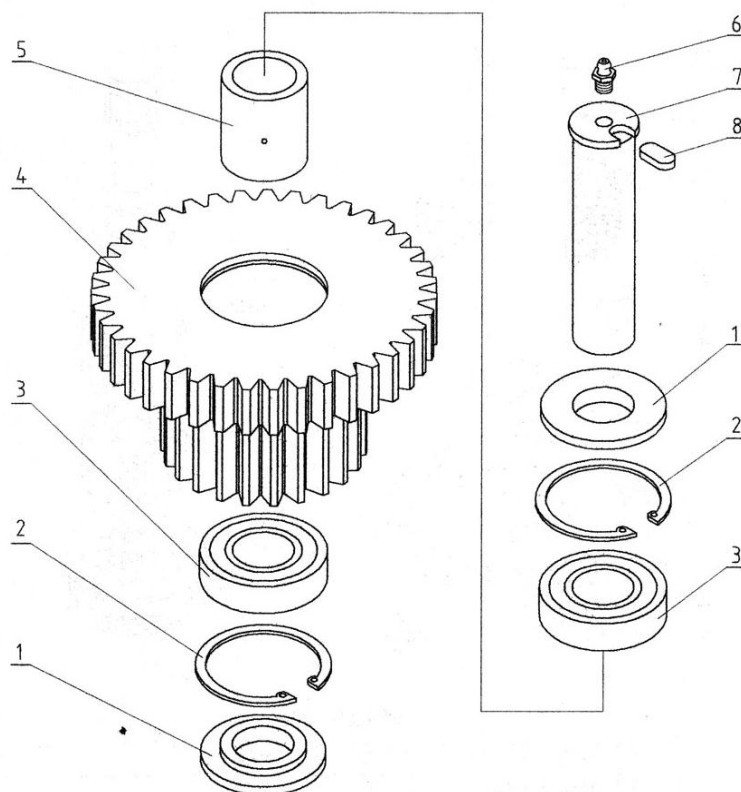


Fig.5 Drive mechanism (Duplex gear)

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—13	XQ6B.Z-03-2	Washer	2
2	Z6—12	GB/T893.1-1986	Circlip for hole 62	2
3	Z6—11	GB/T283-1994	Bearing NJ206E	2
4	Z6—10	XQ6B.Z-03-4	Duplex gear	1
5	Z6—15	XQ6B.Z-03-3	Sleeve	1
6	Z6—39	JB/T7940.1-1995	Grease nipple M8x1	1
7	Z6—14	XQ6B.Z-03-1	Duplex gear shaft	1
8	Z6—38	XQ6B.Z-02-5	Locating plate	1

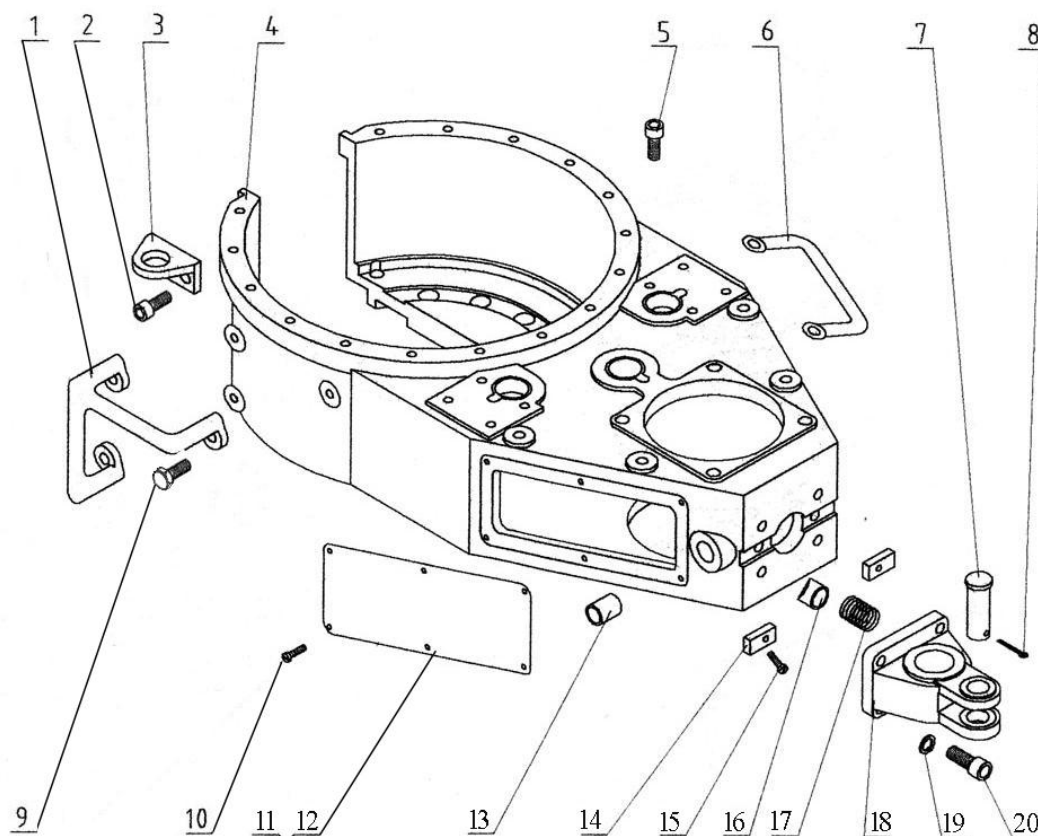


Fig.6 Shell assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—57	XQ6B.Z-04-3	Left/right handle	2
2	Z6—64	GB/T70.1-2000	Hexagon socket head cap screw M10×20	4
3	Z6—2	XQ6B.Z-04-2	Front support	2
4	Z6—4	XQ6B.Z-04-1	Shell	1
5	Z6—1	GB/T70.1-2000	Hexagon socket head cap screw M10×20-8.8	15
6	Z6—61	XQ6B.Z-04-11	Rear handle	2
7	Z6—27	XQ6B.Z-04-6	Tail rope pin	1
8	Z6—26	GB/T91-2000	Cotter pin 4×30	1
9	Z6—65	GB/T5781-2000	Hexagon bolt M10×20	10
10	Z6—126	GB/T65-2000	Slotted cheese-head screw M6×15	12
11	Z6—129	XQ6B.Z-04-12	Product tag	1
	Z6—130	XQ6B.Z-04-13	Torque identification card	1
12	Z6—62	XQ6B.Z-04-10	Hole block	2
13	Z6—83	XQ6B.Z-04-8	Sleeve	2
14	Z6—55	XQ6B.Z-04-9	Key	2
15	Z6—56	GB/T68-2000	Slotted countersunk screw M5×15	2
16	Z6—29	XQ6B.Z-04-5	Locating block	1
17	Z6—28	XQ6B.Z-04-3	Brake spring	1
18	Z6—32	XQ6B.Z-04-4	Tailstock	1
19	Z6—31	GB/T93-1987	Standard elastic ring 12	4
20	Z6—30	GB/T70.1-2000	Hexagon socket head cap screw M12×40-8.8	4

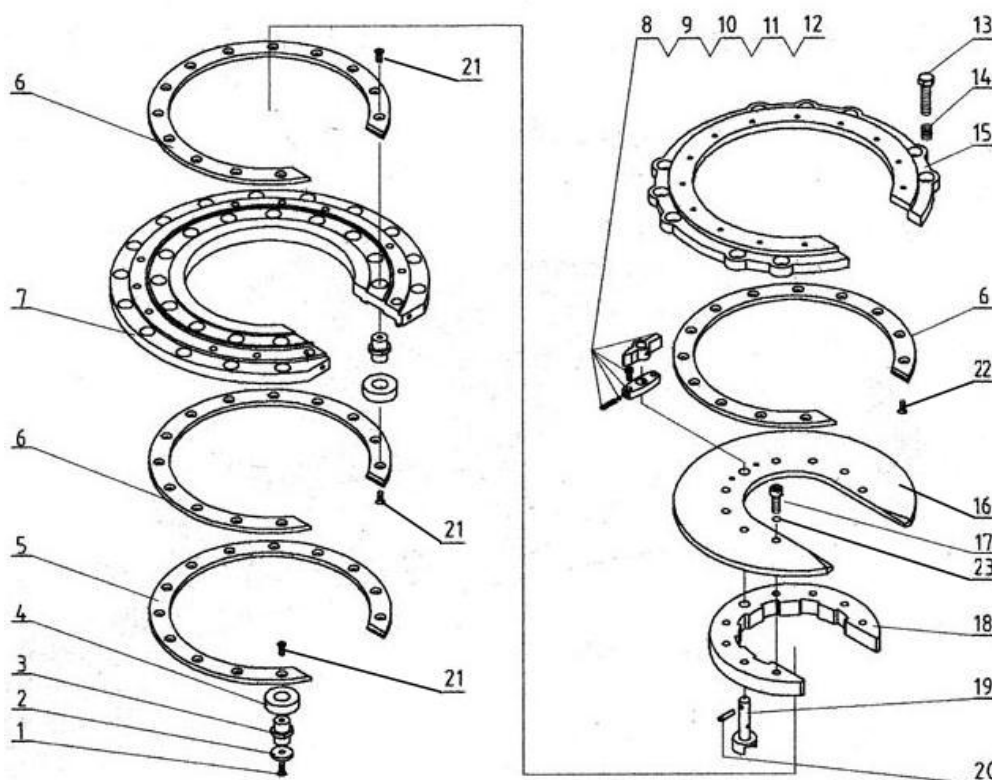


Fig.7 Brake, reset and centralizing mechanism

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—8	GB/T70.1-2000	Hexagon socket head cap screw M5×15-8.8	13
2	Z6—9	XQ6B.Z-05-13	Washer	13
3	Z6—7	XQ6B.Z-05-8	Centralizing Roller shaft	26
4	Z6—5	XQ6B.Z-05-9	Centralizing Roller	26
5	Z6—6	XQ6B.Z-05-12	Friction disc B	1
6	Z6—46	XQ6B.Z-05-10	Friction disc A	3
7	Z6—43	XQ6B.Z-05-5	Tong head cover	1
8	Z6—52	XQ12.Z-05-10	Spring	2
9	Z6—53	GB/T70.1-2000	Hexagon socket head cap screw M5×15	2
10	Z6—117	GB308-89	Steel ball Φ5	2
11	Z6—128	XQ6B.Z-05-6	Locating seat	1
12	Z6—49	XQ6B.Z-05-1	Reset knob	1
13	Z6—54	GB/T32.1-1988	Hexagon bolt M10×45	10
14	Z6—28	XQ6B.Z-05-3	Brake spring	10
15	Z6—44	XQ6B.Z-05-4	Brake plate	1
16	Z6—48	XQ6B.Z-05-11	Brake steel disc	1
17	Z6—25	GB/T70.1-2000	Hexagon socket head cap screw M8×20	8
18	Z6—47	XQ6B.Z-05-7	Joint board	1
19	Z6—51	XQ6B.Z-05-2	Reset knob shaft	1
20	Z6—50	GB/T117-2000	Tapered cotter 5×20	1
21	Z6—21	GB/T819.2-1997	Crosshead countersunk screw M5×15	39
22	Z6—45	GB/T819.2-1997	Crosshead countersunk screw M5×10	13
23	Z6—94	GB/T93-87	Spring washer 8	8

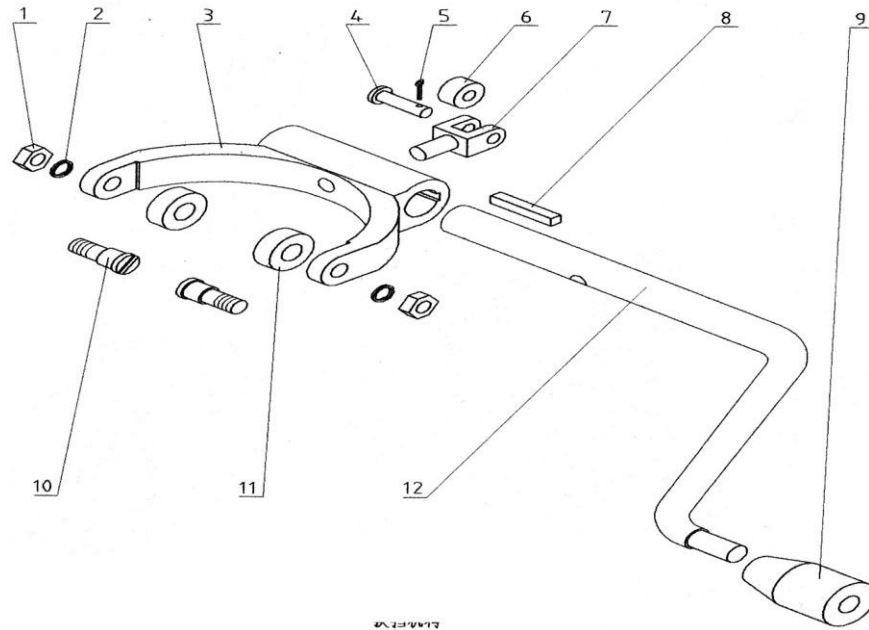


Fig.8 Shifting mechanism

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—95	GB/T6170-2000	Hexagon Nut M8	2
2	Z6—94	GB/T93-1987	Standard Spring Washer 8	2
3	Z6—84	XQ6B.Z-06-3	Shift Fork	1
4	Z6—86	XQ6B.Z-06-7	Roller Shaft	1
5	Z6—87	GB/T91-2000	Cotter Pin 2×10	1
6	Z6—85	XQ6B.Z-06-9	Roller	1
7	Z6—88	XQ6B.Z-06-8	Roller Support	1
8	Z6—89	GB/T1096-1979	Common Flat Key A5×30	1
9	Z6—96	XQ6B.Z-06-5	Ball Handle	1
10	Z6—92	XQ6B.Z-06-2	Roller Shaft	2
11	Z6—91	XQ6B.Z-06-1	Roller	2
12	Z6—90	XQ6B.Z-06-4	Shift Fork Shaft	1

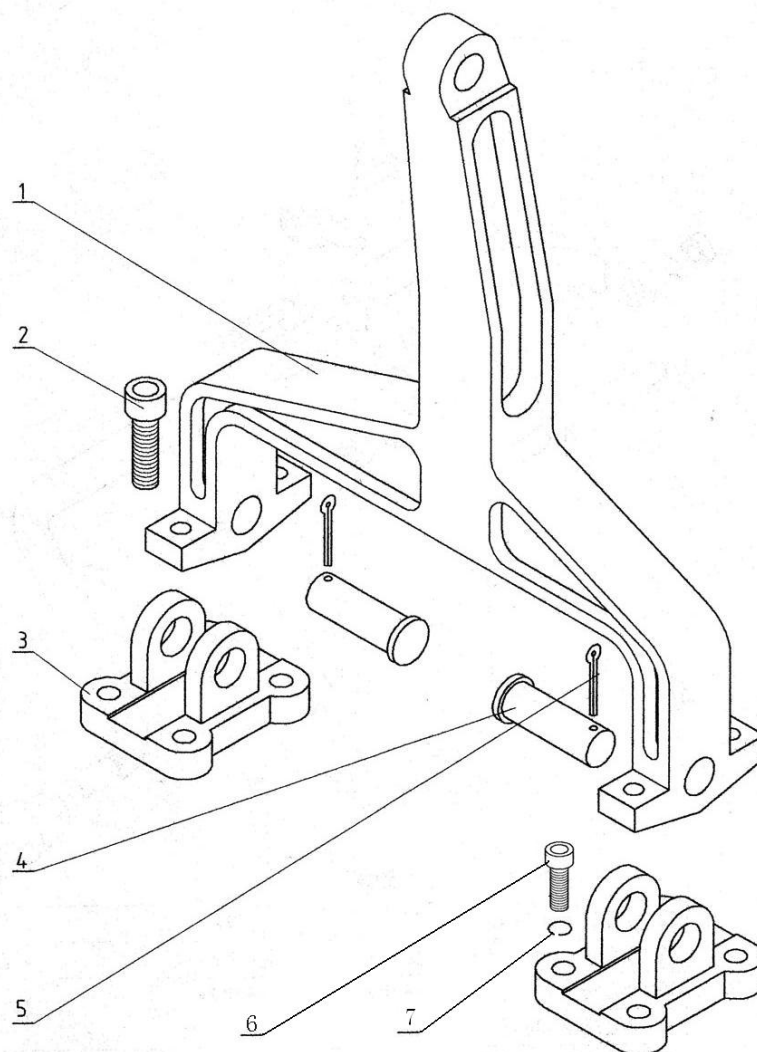


Fig.9 Suspension rod parts

No.	Purchase No.	Part No.	Part Name	Qty.
1	Z6—42	XQ6B.Z-07-1	Suspension rod	1
2	Z6—58	GB/T70.1-2000	Hexagon socket head cap screw M10×35	4
3	Z6—59	XQ6B.Z-07-3	Suspension rod seat	2
4	Z6—41	XQ6B.Z-07-2	Pin Shaft	2
5	Z6—40	GB/T91-2000	Cotter Pin 3×25	2
6	Z6—128	GB/T70.1-2000	Hexagon socket head cap screw M8×25	8
7	Z6-94	GB/T93-87	Spring washer 8	8

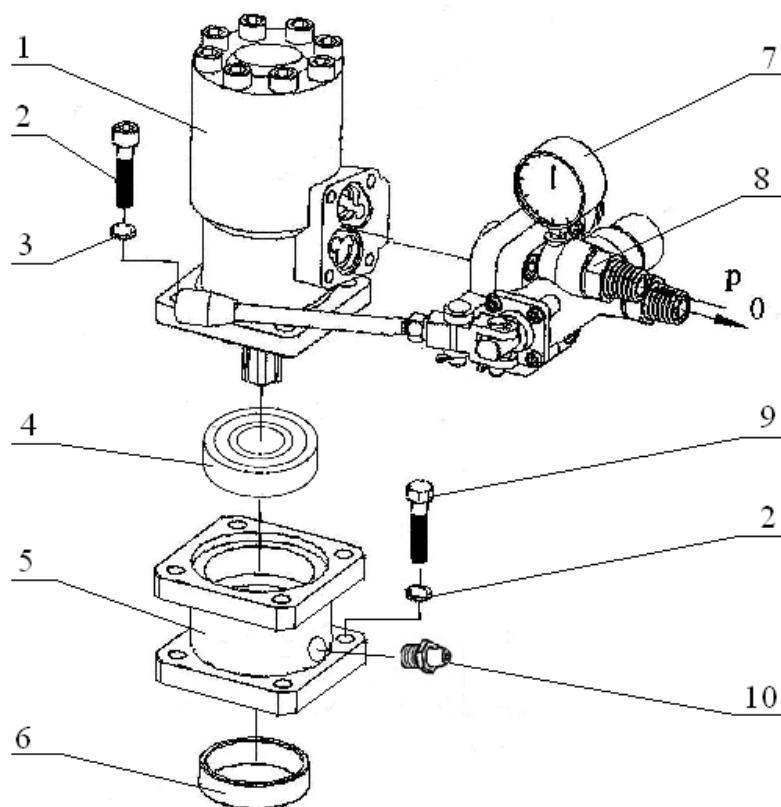


Fig.10 Motor Joint Seat

No.	Purchase No.	Part No.	Part Name		Qty.
1	Z6—35		Cycloid hydraulic motor BM4-500		1
2	Z6—113	GB/T70.1-2000	Hexagon socket head cap screw M12×40		4
3	Z6—31	GB/T93-1987	Standard spring washer 12		8
4	Z6—135	GB/T276-94	Deep Groove Ball Bearings 6130		1
5	Z6—112	XQ6B.Z-08-01	Motor joint seat		1
6	Z6—114	XQ6B.Z-08-2	Motor joint seat liner		1
7	Z6—133	0-16MPa (0-8kN.m)	Pressure and torque meterφ60	Options	1
8	Z6—33		H manual reversing valve		1
9	Z6—134	GB/T5781-2000	Hexagon boltM12×30		4
10	Z6-39	GB7940.1-1995	Straight hydraulic grease nipples M8×1		1

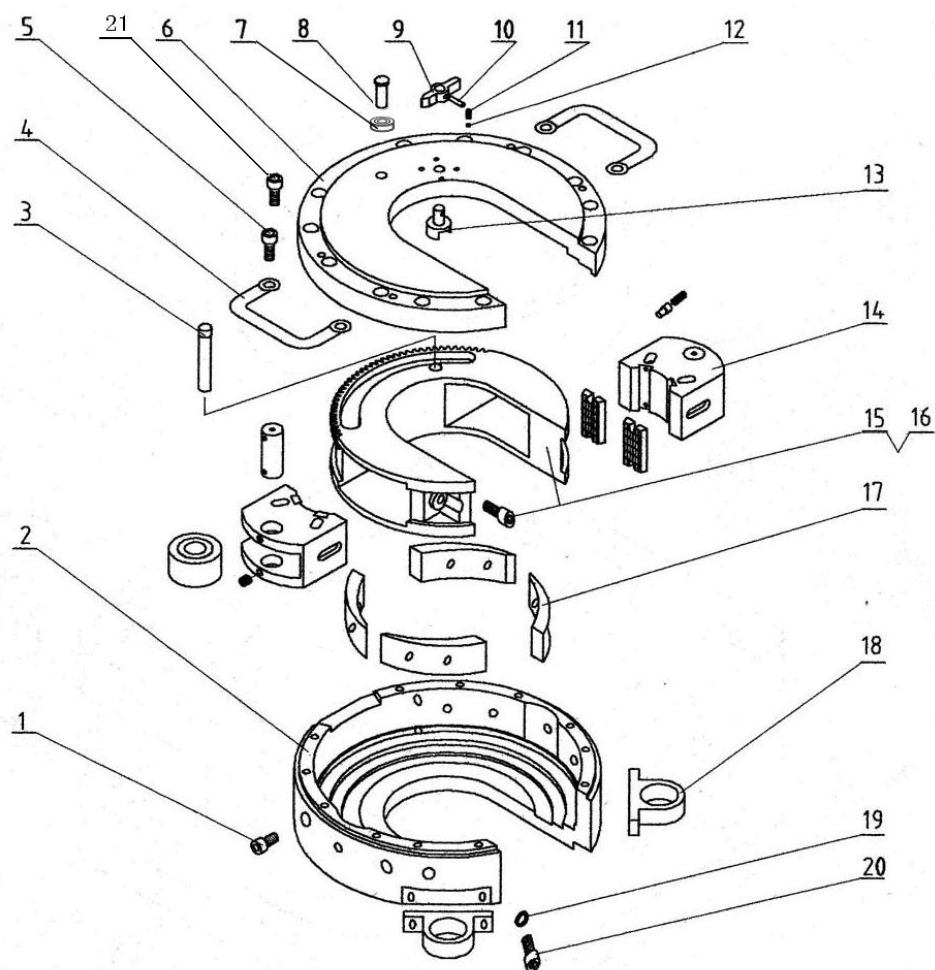


Fig.11 Backup tong head assembly

No.	Purchase No.	Part No.	Part Name	Qty.	
1	B6—20	GB/T70.1-2000	Hexagon socket head cap screw M10×20	8	
2	B6—7	XQ6B.B-09-3	Backup tong body	1	
3	B6—5	XQ6B.B-09-5	Retaining pin	1	
4	Z6—61	XQ6B.Z-04-11	Back handle	2	
5	B6—63	GB/T5781-2000	Hexagon socket head cap screw M10×20	4	
6	B6—1	XQ6B.B-09-11	Backup tong head cover	1	
7	B6—19	XQ6B.B-09-7	Roller	1	
8	B6—65	XQ6B.B-09-6	Pin	1	
9	B6—3	XQ6B.B-09-9	Backup tong reset knob	1	
10	B6—2	GB/T117-2000	tapered cottar 5×20	1	
11	Z6—52	XQ12.Z-05-10	Spring	2	
12	B6—17	GB308-89	Steel ball Φ5	2	
13	B6—4	XQ6B.B-09-8	Backup tong reset knob shaft	1	
14	B6—31	XQ6B.B-09-1A	Jaw 93-89	Standard layout	2
		XQ6B.B-09-1B	Jaw 114.5-107		
		XQ6B.B-09-1C	Jaw 141.5-132.5		

		XQ6B.B-09-1D	Jaw 63-60	Options	
		XQ6B.B-09-1E	Jaw 73-70		
		XQ6B.B-09-1F	Jaw 78-75		
15	Z6—81	XQ12.Z-02-12	Fixing screw M12×25		2
16	B6—6	XQ6B.B-09-4	Backup tong jaw bracket		1
17	B6—24	XQ6B.B-09-2	Backup tong ramp		4
18	B6—21	XQ6B.B-09-12	Backup tong fore-support		2
19	B6—23	GB/T93-1987	Standard Spring Washer 12		4
20	B6—22	GB/T70.1-2000	Hexagon socket head cap screw M12×30		4
21	Z6-30	GB/T70.1-2000	Hexagon socket head cap screw M10×30		12

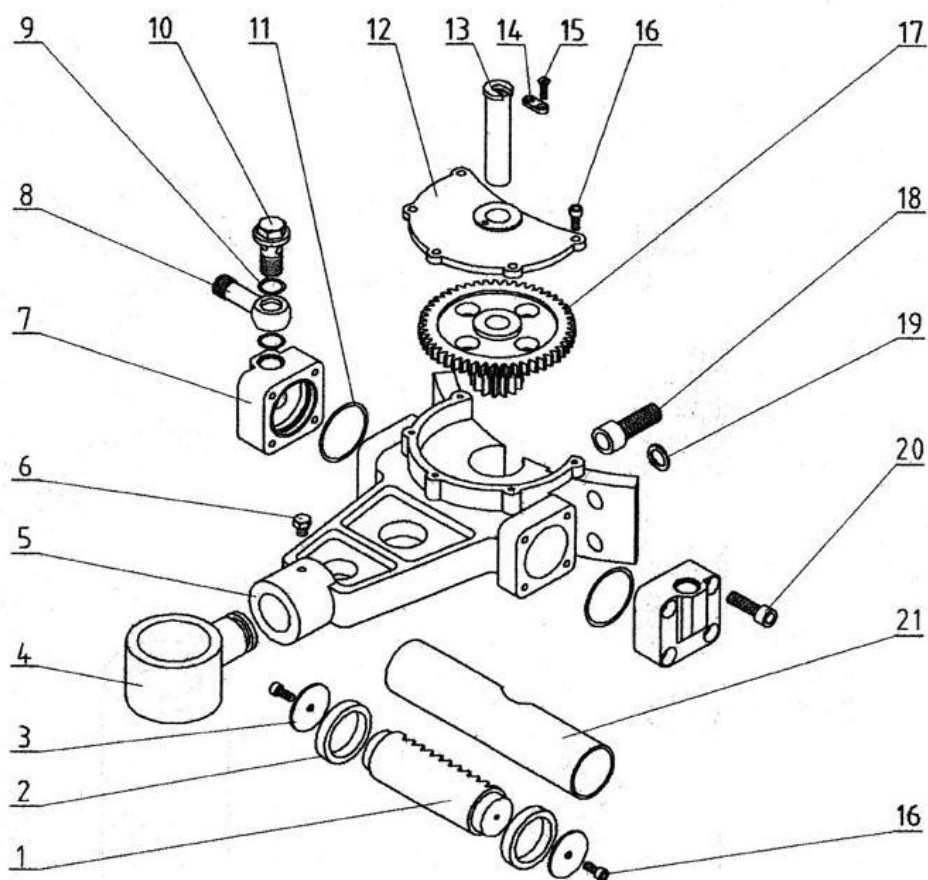


Fig.12 Backup tong tail assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	B6—41	XQ6B.B-10-4	Rack plunger	1
2	B6—39	JB/TZQ4264-1997	Yx ring seal D45	2
3	B6—40	XQ6B.B-10-9	Cover plate	2
4	B6—62	XQ6B.B-10-11	Backup tong end base	1
5	B6—15	XQ6B.B-10-10	Backup tong tail bed	1
6	B6—18	GB/T5781-2000	Hex-head bolt M8×20	1
7	B6—38	XQ6B.B-10-6	Cylinder cover	2
8	B6—45	XQ6B.B-10-7	Joint	2

9	B6—46	GB/T3452.1-1992	O-ring seal 17×2.65 (22×2.4)	4
10	B6—44	XQ6B.B-10-8	Bolt18×1.5	2
11	B6—36	GB/T3452.1-1992	O-ring seal 50×2.65	2
12	B6—12	XQ6B.B-10-12	Gear cover	1
13	B6—8	XQ6B.B-10-2	Shaft	1
14	B6—9	XQ6B.B-10-3	Set disc	1
15	B6—10	GB/T68-2000	Hexagon socket head cap screw M6×10	1
16	B6—10	GB/T70.1-2000	Hexagon socket head cap screw M6×16	7
17	B6—11	XQ6B.B-10-1	Duplex gear	1
18	B6—34	GB/T70.1-2000	Hexagon socket head cap screw M16×40	4
19	B6—33	GB/T93-1987	Standard spring washer 16	4
20	B6—35	GB/T70.1-2000	Hexagon socket head cap screw M10×30	8
21	B6—54	XQ6B.B-10-5	Cylinder liner	1

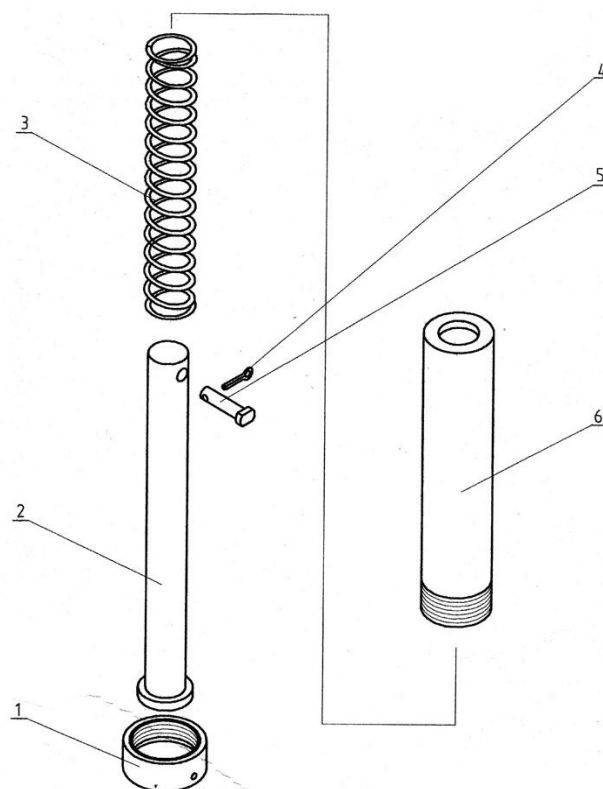


Fig.13 Back guide rod assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	HD6—1	XQ6B.G-11-5	Rear guide rod seat	1
2	HD6—3	XQ6B.G-11-2	Rear guide rod	1
3	HD6—5	XQ6B.G-11-4	Spring	1
4	HD6—2	GB/T91-2000	Cotter pin 3×20	1
5	HD6—6	XQ6B.G-11-1	Pin	1
6	HD6—4	XQ6B.G-11-3	Rear guide rod sleeve	1

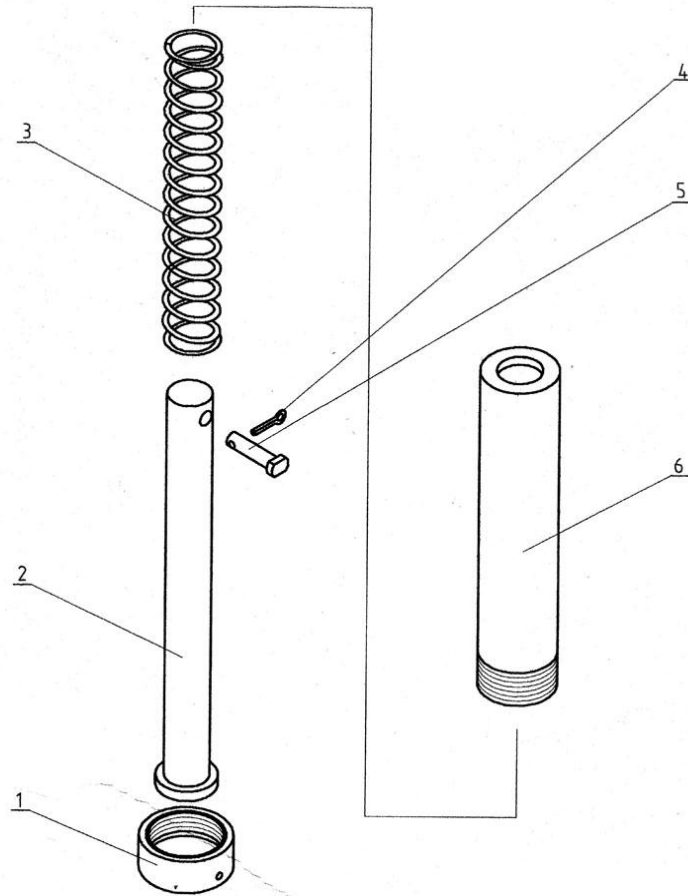


Fig.14 Front guider rod assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	QD6—1	XQ6B.G-12-5	Front guide rod seat	2
2	QD6—3	XQ6B.G-12-2	Front guide rod	2
3	QD6—5	XQ6B.G-12-4	Spring	2
4	QD6—2	GB/T91-2000	Cotter pin 3×20	2
5	QD6—6	XQ6B.G-12-1	Pin	2
6	QD6—4	XQ6B.G-12-3	Front guide rod sleeve	2

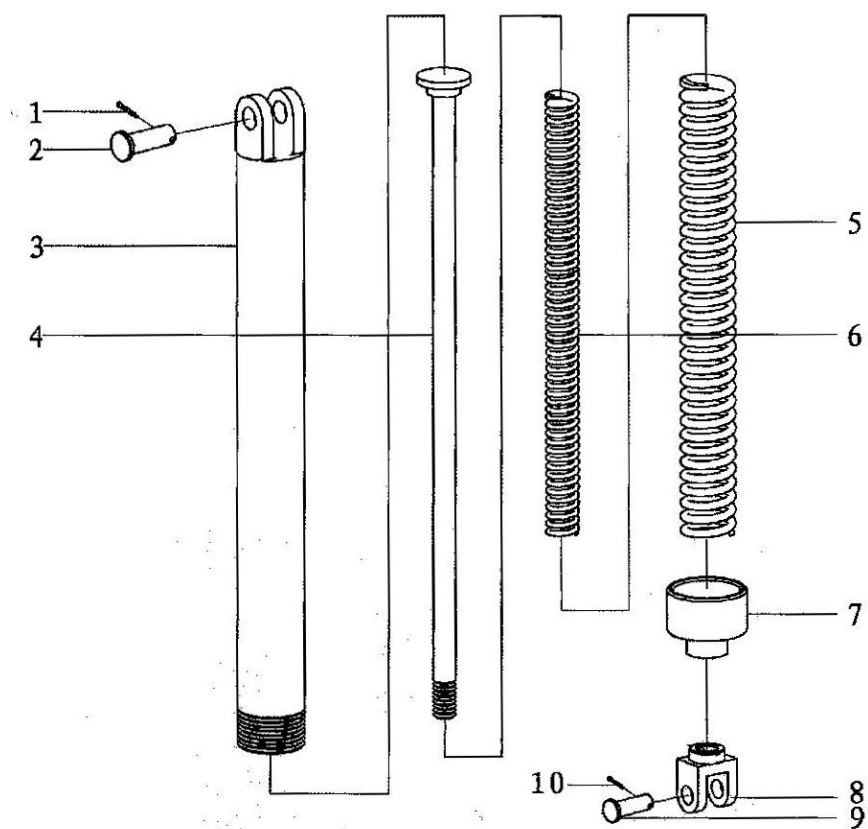


Fig.15 Hanging bucket assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	DT6—10	GB/T91-2000	Cotter pin 4x30	1
2	DT6—9	XQ6B.T-13-7	Pin (1)	1
3	DT6—7	XQ6B.T-13-3	Bucket body	1
4	DT6—5	XQ6B.T-13-4	Rod (assembly)	1
5	DT6—6	XQ6B.T-13-5	Spring	1
6	DT6—8	XQ6B.T-13-6	Spring	1
7	DT6—4	XQ6B.T-13-2	End cover	1
8	DT6—2	XQ6B.T-13-1	Jaw	1
9	DT6—3	XQ6B.T-13-8	Pin (2)	1
10	DT6—1	GB91-2000	Cotter pin 3.2x26	1

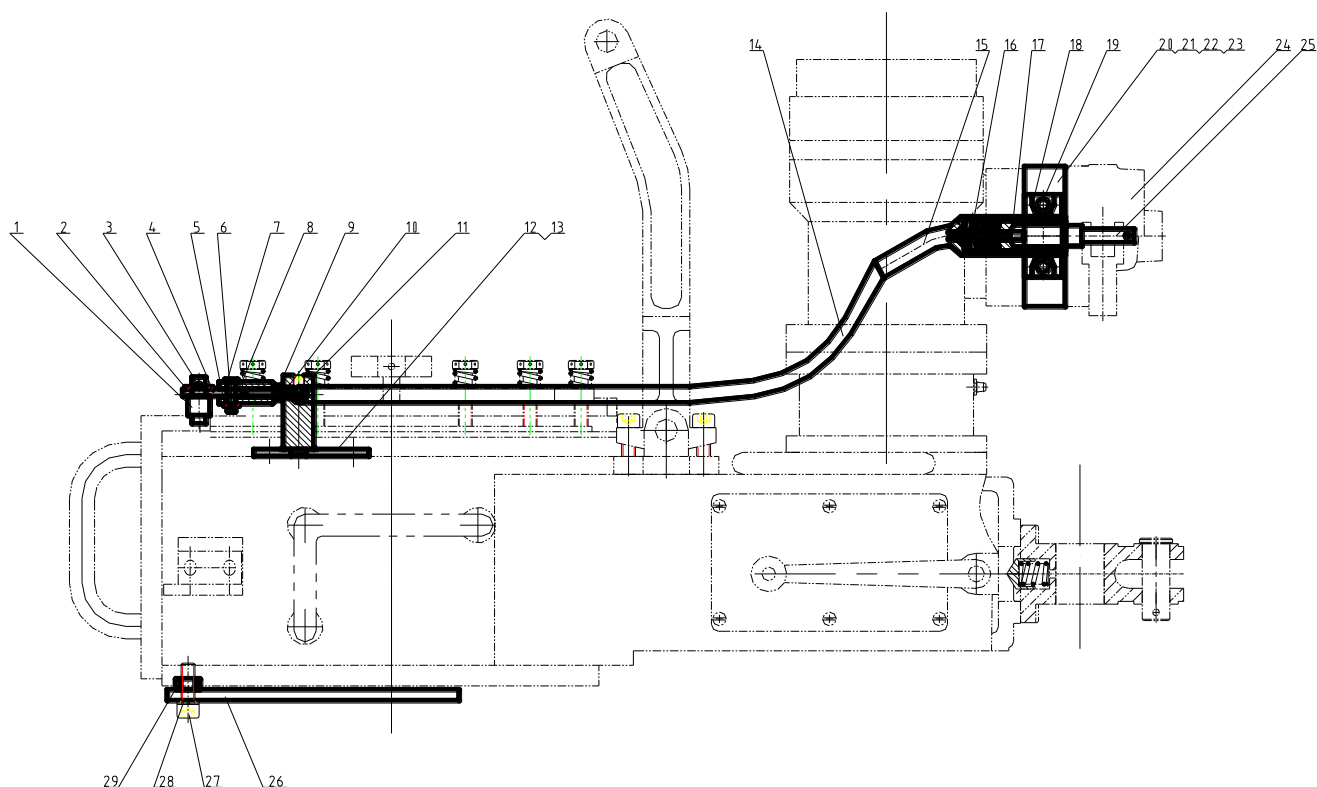


Fig.16 Self-locking device assembly

No.	Purchase No.	Part No.	Part Name	Qty.
1	ZS6-1	XQ6B.ZS-01	Tension spring pin shaft	1
2	ZS6-2	GB/T95-2002	Flat washer 10	1
3	ZS6-3	GB/T91-2002	Cotter pin 2.5×16	1
4	ZS6-4	XQ6B.ZS-02	Zipper pulls	1
5	ZS6-5	GB/T95-2002	Flat washer 6	1
6	Z6-87	GB/T91-2002	Cotter pin 2×10	1
7	ZS6-7	XQ6B.Z-06-7	Roller shaft	1
8	ZS6-8	XQ12.ZS-03	Zipper pulls joint	1
9	ZS6-9	GB/T6170-2002	Nut M6	1
10	ZS6-10	XQ12.ZS-04	Joint	1
11	ZS6-11	XQ6B.ZS-04	Self-locking locating plate	1
12	ZS6-12	XQ6B.ZS-05	Self-locking bracket base	1
13	ZS6-13	GB/T70.1-2000	Hexagon socket head cap screw M10×30	2
14	ZS6-14	XQ6B.ZS-07	Bracing wire	1
15	ZS6-15	XQ12.ZS-07	Self-locking bracket	1
16	ZS6-16	XQ12.ZS-08	Spring	1

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17	ZS6-17	XQ6B.ZS-06	Locking sleeve	1
18	ZS6-18	XQ12.ZS-10	Self-locking base	1
19	ZS6-19	GB/T70.1-2000	Hexagon socket head cap screw M8×15	2
20	ZS6-20	XQ6B.ZS-10	Oil motor valve plate	1
21	Z6-25	GB/T70.1-2000	Hexagon socket head cap screw M8×20	2
22	Z6-94	GB/T93-87	Spring washer 8	2
23	ZS6-23	GB/T3452.1-2005	O ring 17×2.65 (22×2.4)	2
24	ZS6-29	GB/T70.1-2000	Hexagon socket head cap screw M12×60	4
25	ZS6-24	XQ12.ZS-11	Pin	1
26	ZS6-28	XQ6B.ZS-08	Pusher	1
27	B6-20	GB/T70.1-2000	Hexagon socket head cap screw M10×20	2
28	ZS6-26	GB/T93-87	Spring washer 10	2
29	ZS6-25	XQ6B.ZS-03	Self-locking bushing	2