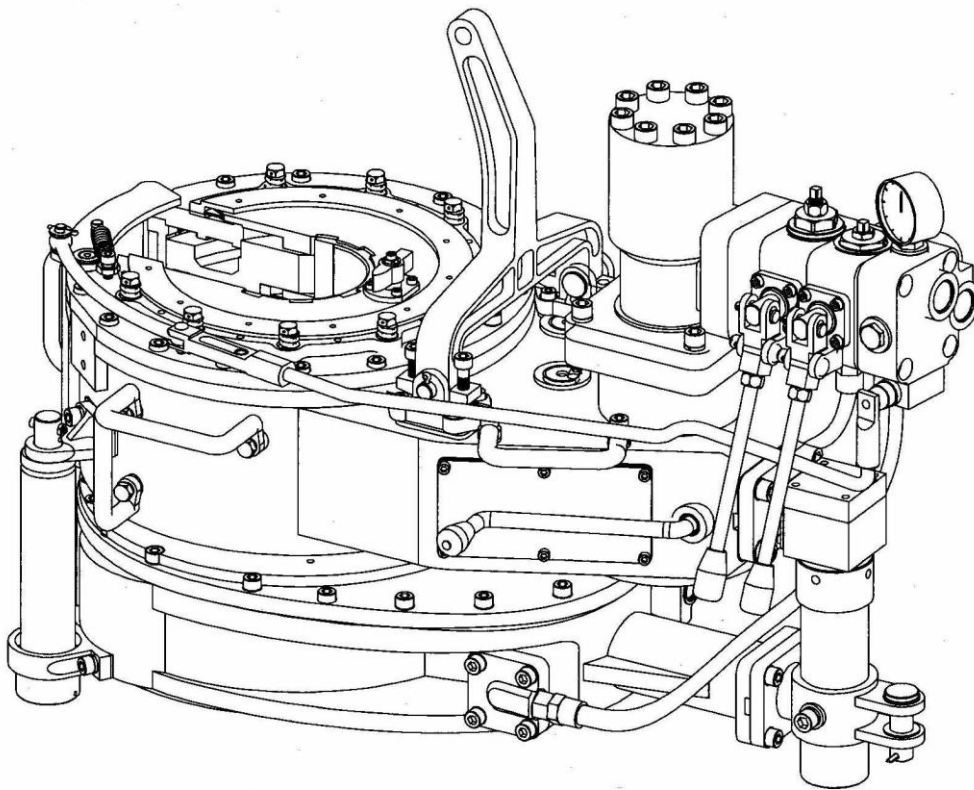


# MODEL XQ114/6C HYDRAULIC POWER TONG



## PARTS AND OPERATION MANUAL

[www.bigrigsupply.com](http://www.bigrigsupply.com)

[info@bigrigsupply.com](mailto:info@bigrigsupply.com)

**Safety Instruction and Legend Description**

- Operators must read and know this manual well.
- Operators must wear work uniform, safety shoes, safety helmet, safety gloves, etc.
- Tie the back guy according to the instruction. Don't tie it in the wrong direction.
- Operation at the side of tong body opening.
- Don't touch the running parts with hands when the tong is running.
- Don't touch the running parts with hands when the tong is running.
- Keep sundries out of the working area.
- The pump should be off or the hydraulic tong power shut down as maintaining or hanging the jaw plates, die seats or tong dies.
- Over-pressure and over-torque are forbidden.
- Don't add or dismount any parts to the tong.

## Legend Description

 **Serious Warning**

 **Warning**

 **Recommendation or Suggestion**



***Safety first, standard operation  
problems may occur if bugs are  
not rid of.***

## CONTENTS

1. Summary.....	1
2. Technical parameters.....	1
3. Oil hydraulic circuit.....	2
4. Connection between pressure and torque.....	2
5. Installation.....	3~5
5.1 Examination before installation.....	3
5.2 Hanging.....	3
5.3 Install rubber hose.....	3
5.4 Leveling and adjusting the space between master tong and backup tong.....	4
5.5 Tie back guy.....	4
5.6 Adjust braking force.....	5
6. Operation.....	5~10
6.1 Makeup operation.....	5
6.2 Break-up operation.....	6
6.3 Shift gear control.....	7
6.4 Adjust the system pressure and flow rate.....	7
6.4.1 Adjust the upper breaking out system pressure.....	7
6.4.2 Adjust the backup tong flux.....	7
6.5 Change jaw plate, die seat.....	8
6.5.1 Assembly of jaw plate, die seat and dies.....	8
6.5.2 Die seat specification .....	8
6.5.3 Corresponding table between jaw plate, die seat and tubular pile.....	8
6.5.4 Jaw plate mounting /dismounting.....	9
6.5.5 Die seats mounting /dismounting.....	9
6.5.6 Dies mounting/dismounting.....	9
6.5.7 Changing dies of backup tong.....	10
6.6 Install planetary claw, planetary gear.....	10
7. Maintenance.....	11~13
8. Common troubles and troubles shooting guide.....	13~14
9. Portage, Storage and After Sales Service.....	15
10. Table of quick-wearing accessory.....	16
11. Figures and parts list.....	17



## 1 Summary

Model XQ114/6C hydraulic power tong is an open type power tong for the making up and breaking out of tubing in well services. Backup tong adopt planetary grip mechanism, belongs the latest patented product. It is used in making-up or breaking-out tubing, small drilling pipe and small casing with diameters  $\Phi 60, 73, 89, 114$  mm. It adopts second gear to change speed, equipped with hydraulic backup tong, it features simple structure, convenient operation, reliable performance, long life, broad application range and large torque. It can reduce workload, improve work efficiency and the well service quality. This product has the following features:

- Adopted national invention patent, backup tong cannot change any part within the range of suitable.
- Adopted double valve patented technology, ensure the backup tong is reliable, it also has the overload protection function.
- Addition gate unloading mechanism, the tong stops when the door open, the tong starts when the door closed, make the operator safer.
- Backup tong can stuck coupling and tubing.
- Customers can selective equipped torque control system, it can show, record and control make up torque

## 2 Technical parameters

### 2.1 master tong

- |                                  |  |
|----------------------------------|--|
| (1) Application range            | $\Phi 60, 73, 89, 114$ mm pipeline, drill rod subs and small casing pipe (23/8"~41/2") |
| (2) High gear rated torque       | 1.65 kN.m  |
| (3) Low gear rated torque        | 6.0 kN.m   |
| (4) High gear max rotation speed | 85 r/min   |
| (5) Low gear max rotation speed  | 23 r/min   |

### 2.2 Backup tong

Application range	$\Phi 60 \sim 141.5$ mm pipeline, coupling and drill rod sub (23/8"~59/16")
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2.3 Rated system pressure:	12 MPa
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2.4 Max oil supply	100 L/min
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2.5 Combination tong weight	304 kg
-----------------------------	--------

2.6 Overall dimension (L×W×H)	900×515×710 mm
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### 3 Oil hydraulic circuit (see Fig.1)

As shown in figure1, P signify oil inlet, O signify oil outlet. Valve 1 is three ways six ports valve, used for separately control backup tong. Valve 2 is type H three ways four ports valve, used for control hydraulic motor 3 of master tong and rack plunger of backup tong.

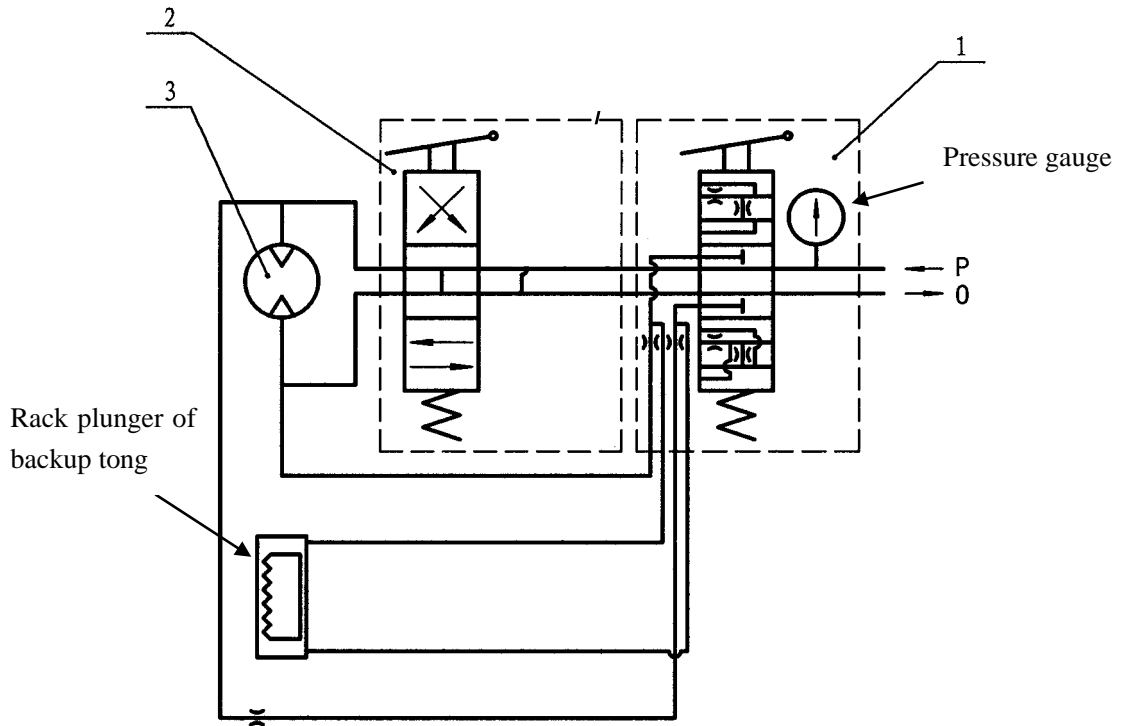


Fig.1 Oil hydraulic circuit dual valve

### 4 Connection between pressure and torque (see Fig.2)

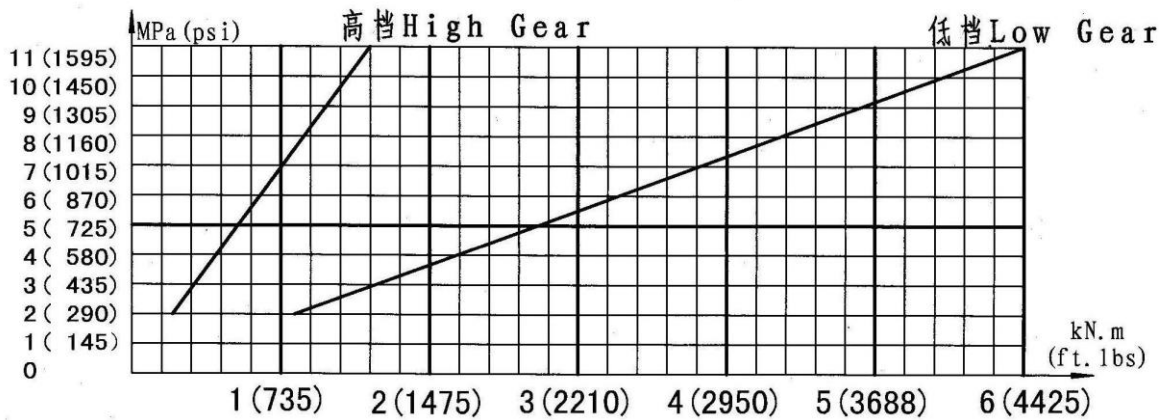


Fig.2



## 5 Installation

### 5.1 Examination before installation

- Examine the power tong, if damage by transportation should be maintained.
- Examine the fastener, if loose tightened.

### 5.2 Hanging

Connect lift with tong hanging rod (XQ6C-43) and hang the tong on the derrick of workover rig. The hanging height is proper when the backup tong could rightly grip the tubing collar(see Fig.3).

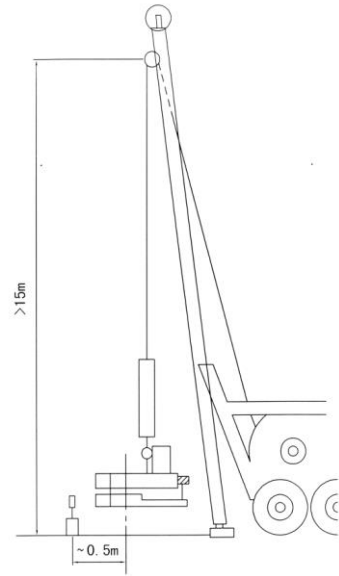


Fig.3



- The hanging point is 15 m above ground.
- Under free hanging, power tong head's center is about 0.5m above the well center.
- Adjust the extend end of suspender face down, when installing the casket.

### 5.3 Install rubber hose

High-pressure rubber hose joined to hydraulic power, oil inlet hose joined to upside oil port of hand control valve, oil outlet hose joined to bottom oil port of hand control valve, be sure not to joint wrong place.



- Central line of the power tong head is located at 0.6m away from the vertical line of the well head in free suspension state.
- In using process, operator needs attention the hose of hydraulic canister snapped because of twining.
- The piston rod extends and faces downward when installing the bucket.



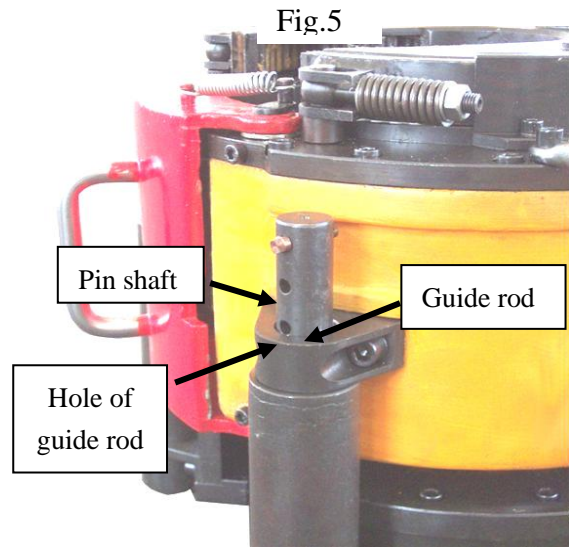
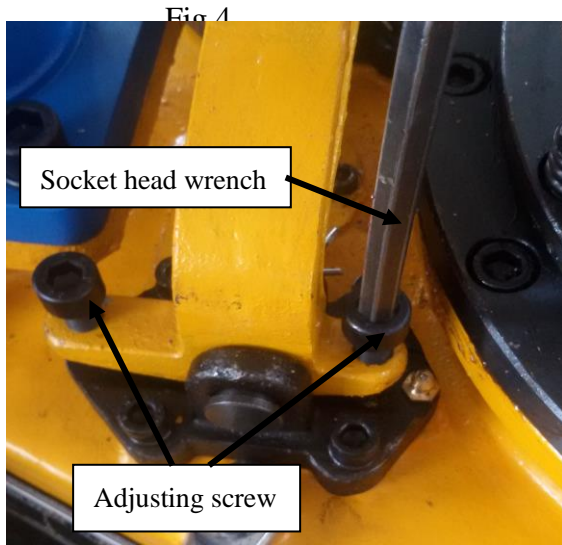
- The suspension height of the hydraulic tong can be adjusted easily with the hydraulic bucket.
- When the backup tong directly faces the pipe string coupling or the drilling pipe joint, the piston rod of the bucket should be located at half of the stroke

### 5.4 Leveling and adjusting the space between master tong and backup tong

Push hydraulic power tong to the clamping position. Check whether tong head level or not. If it is not level, keep master tong level by adjusting four screws (Fig.4) on the suspension bar. Check whether the backup tong parallel to the master tong or not, if not, adjust them by adjusting the pin



shaft to suitable hole of guide rod. (see Fig.5)



- ❑ Power tong leveling is very important, if not level, the tong head clamping will fail to work.
- ❑ Four screws should be adjusted in coordination.

when making up, ensure the space between the upper surface and seat  $L \geq 50\text{mm}$ , see Fig.6. When breaking up, the space can decrease to zero or not more than 50mm. If the backup tong stuck tubule to make up, the space need adjust.

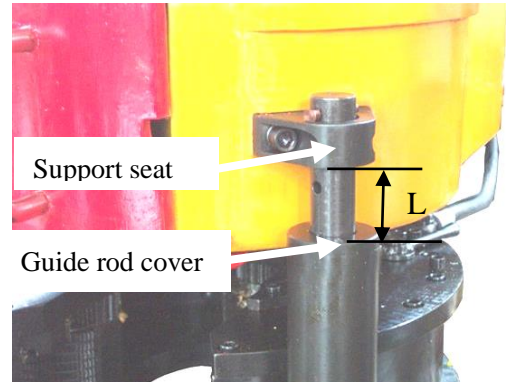


Fig.6

### 5.5 Tie Back Guy

Tie one end of back guy on derrick and the other end on back guide seat of power tong, back guy should be capable of bearing a load of 20 kN, when power tong is in makeup position, the back guy should be at right angle to the tong and on the opposite side of operator who operates the control handle (see Fig.2), this insures a safe operation

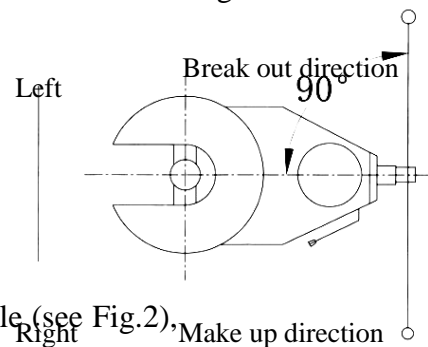


Fig.7



- Back guy, which is usually soft wire rope, must be able to bear load of over 6600bf.



## 5.6 Adjust braking force

Turn the adjusting screw XQ6C-85, press the braking spring (XQ6C-87) and reverse 360°. (see Fig.8)



Braking spring fails to work, loosen or quantity not sufficient will make master tong slips.



Braking torque oversize is not suitable, it is appropriate when the master tong and backup tong teething smoothly.

## 6 Operations

**6.1 Makeup operation** (This manual is suitable for making-up or breaking-out direction with right hand thread, but the left hand thread is on the contrary.)

- Hydraulic power tong does racing, make it back to preliminary working state. Select proper gear according to actual requirement (usually high gear).
- Turn the reset knobs of the master tong and backup tong to the making-up direction; make sure the knobs point in the same direction.
- Open the safety door, push hydraulic power tong towards the pipe string, and make sure the clamping position by master tong and backup tong is right.
- Close the safety door.
- Push the tong tail to make the tong turn around the rotating center, tighten the guy.
- Push hand control valve lever gently to begin the making-up operation.





- Continue the making-up operation until power tong stops and releases the lever.
- Make up at low gear according to the requirement until the making-up torque meets the demand
- Pull the lever of the hand control valve to make tong back to the initial working position.
- Open the safety door, push tong back to the preliminary position. One making-up operation is over.



- Don not disassemble hydraulic pipe at a high pressure, otherwise, accidents may occur and the equipment may be damaged.
- Don not approach the running part of hydraulic power tong by your body or clothes.
- Only operators are allowed to approach hydraulic tong to avoid trouble caused by turning the operating lever.



- Making up under over torque circumstances can damage tubing
- Use under over pressure can damage the hydraulic power tong!



- Operation should be gently, ensure not damage the parts as gears because of not centering operation
- Operator need anastole planetary grip mechanism of backup tong, otherwise may damage annular gear of backup tong.



- Operator should make up as API recommend.

### 6.2 Break-up operation (based on right hand thread, left hand thread is on the contrary.)

Hydraulic power tong does racing, make it back to preliminary working state. Select proper gear according to actual requirement (usually low gear) .

- Turn the reset knobs of the master tong and backup tong to breaking-out direction, make sure the knobs point in the same direction.
- Open the safety door, push hydraulic power tong towards the pipe string, and make sure the clamping position of master tong and backup tong is proper.
- Close the safety door.
- Pull the tong tail to make tong turn around the rotating center, tighten the back guy.
- Pull the hand control valve operating lever gently to start breaking-out operation.



- Continue breaking-out operation till all screws thread out, then release operating lever.
- Push hand control valve operating lever to make tong back to the preliminary working state.
- Open the safety door, push tong back to the preliminary position. One breaking-out operation is finished.



- Over torque can damage casing as well as the hydraulic power tong!
- Don't make-up or break-out before the safety door is closed well !



- During the breaking-out operation, the max length of the backup tong moving downward should be longer than the length of the screw extended out, otherwise the front and back guide pole should be repaired.



- If the retracting speed of planetary grip mechanism of backup tong is slower than master tong when break up at low gear or second low gear, operator need , specific methods see 6.4.2.



- Operation should be gently, ensure not damage the parts as gears because of not centering operation
- Operator need anastole planetary grip mechanism of backup tong, otherwise may damage annular gear of backup tong.



- Keep the operating area of the power tong clean to prevent sundries in. Tidy the hydraulic hose, electric wire, and signal line to avoid twisting or getting cut off.



- Operator cannot use control valve of backup tong when operate the reversing valve can meet requirements of backup tong.
- The control valve of backup tong use on occasion to make sure the backup tong work reliably.



### 6.3 Shift Gear Control

Manipulate hand control valve (XQ6C-56), press fork axle gear (XQ6C-155), it is top gear, manipulate hand control valve, up fork axle gear, now it is low speed gear. Gear shift operation must be carried out under low speed to avoid any damage to transmission gear.

### 6.4 Adjust the system pressure and flow rate

#### 6.4.1 Adjust the upper breaking out system pressure

Operator can lose the locknut of hand control valve before adjusting. Break-out operates at high gear; adjust the break out system pressure while the mater tong and backup tong clamp tubulars or bars. Twist the screw slowly, system pressure rise slowly, tighten the screw lock nut when reached its desired value, see Fig.9.

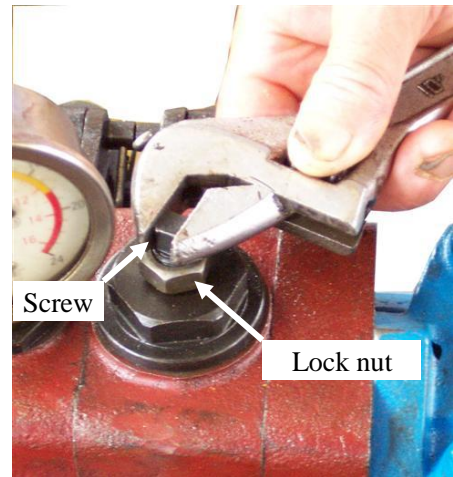


Fig 9

#### 6.4.2 Adjust the backup tong flux

Backup tong is flux can affect the claw out and retract speed of backup planetary grip mechanism. Flux controlled by adjusting screw, change the throttle pore size can change the speed (adjusting screw set before leave factory), throttle pore size smaller, the speed faster. As shown in Fig.10, operator can change the adjust nut after take-off the pressure gage of backup tong, small round nut and reducer connector

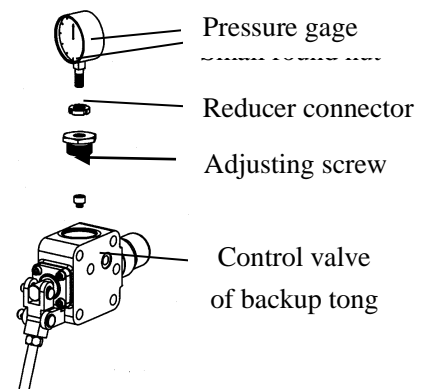


Fig.10

### 6.5 Change aw plate, die seat

#### 6.5.1 Assembly of jaw plate, die seat and dies(see Fig.11)

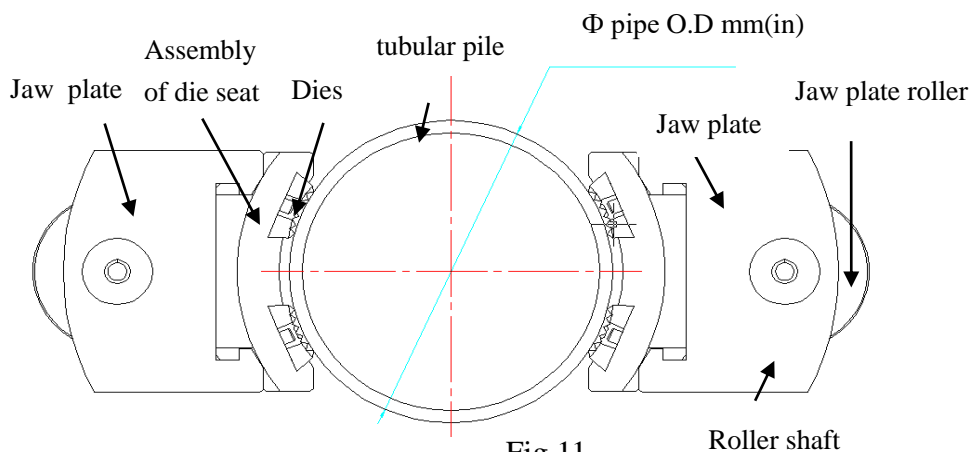


Fig.11



6.5.2 Die Seat Specification

Table 1 Die Seat Specification

NO.	Purchase Number	Part Name	Mark (steel mark)	Note
1	XQ6C-69(1)	Die Seat (1)	6C-114	
2	XQ6C-69(2)	Die Seat (2)	6C-89	
3	XQ6C-69(3)	Die Seat (3)	6C-73	
4	XQ6C-69(4)	Die Seat (4)	6C-60	purchased by user

6.5.3 Corresponding table between jaw plate, die seat and tubular pile

Table 2 Corresponding table between die seat and tubular pile

Tubular pile type	O.D mm(in)	die seat (steel mark)
Oil tube	60(2 3/8")	6C-60
Oil tube	73(2 7/8")	6C-73
Oil tube	89(3 1/2")	6C-89
Oil tube	114(4 1/2")	6C-114
Oil tube		

6.5.4 Jaw plate mounting /dismounting

When dismantling jaw plate, take out two die seats first, then turn the tong head, expose the positioning screw on the jaw plate frame from the opening of the tong head, loose the positioning screw, then the jaw plate can be taken out from the center of the tong head. Mounting operation procedure is just on the contrary (See Fig.12)

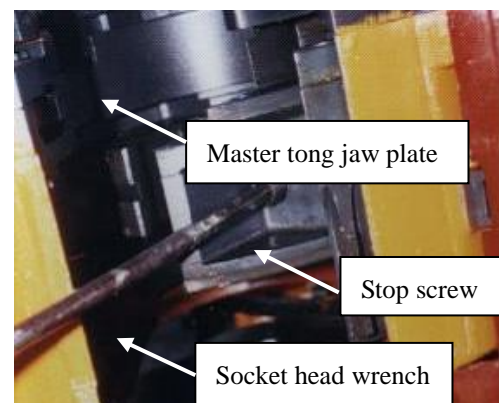


Fig.12

6.5.5 Die seats mounting /dismounting

Dismounting die seat assembly: pull one die seat assembly to the center of tong head, lift it upward out of tong head directly, take out the other one in the same way. Mounting operation is the other way round (see Fig.13).

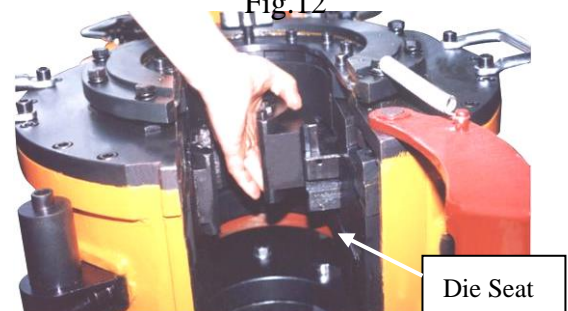


Fig.13



### 6.5.6 Dies mounting/dismounting

Take out die seat and loose the screw pin on one end, then take out dies. Mounting operation is the other way round; tighten the screw pin after mounting (see Fig.14)

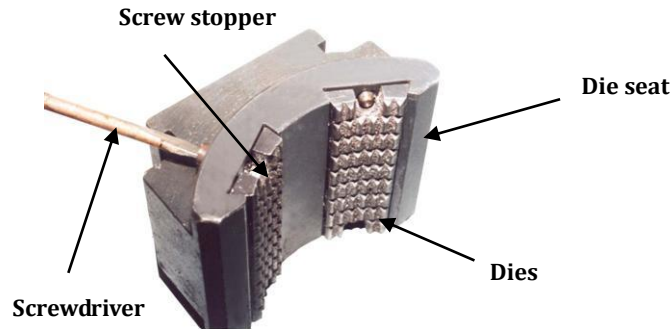


Fig.14



Die seats and dies must be changed in pairs.



The hydraulic power source must be cut off when changing jaw plates, die seats and dies.



Refer to the steel mark on the die seat and dies for the specification.

### 6.5.7 Changing dies of backup tong

Operator can turn the rotary knob to make up direction of master tong (break out direction), turn the rotary knob to break out direction of master tong (make up direction), while the master tong and backup tong opening aligning (The initial work location). At this time, dies of master tong not stretch out, dies of backup tong stretch out. when the screw of dies expose form backup tong, take out the dies after remove screw, change new dies, install screw, changing dies is over. One signal surface of planetary grip has three dies , the outmost die has arced slot (see Fig.15) should outward.

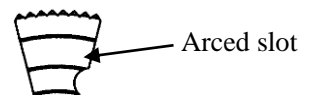
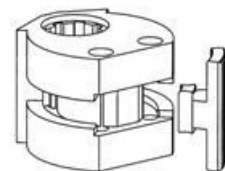


Fig.15



- The outmost die's arced slot should outward. Otherwise, the socket head cap screw cannot install.

## 6.6 Install planetary claw, planetary gear

The curved die plate, spline shaft cover and planetary claw of planetary gear and inner ring

install as Fig.16. Aligning as mark in Fig.17. Ensure the center line of planetary gear coincide with center line of planetary claw (Fig.16).Then install backup tong cover, mandrel e.g parts.

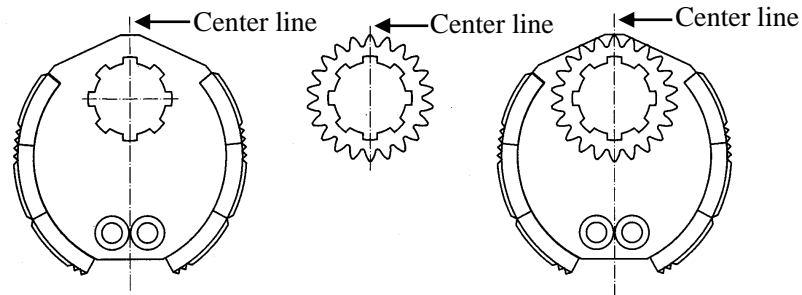


Fig.16

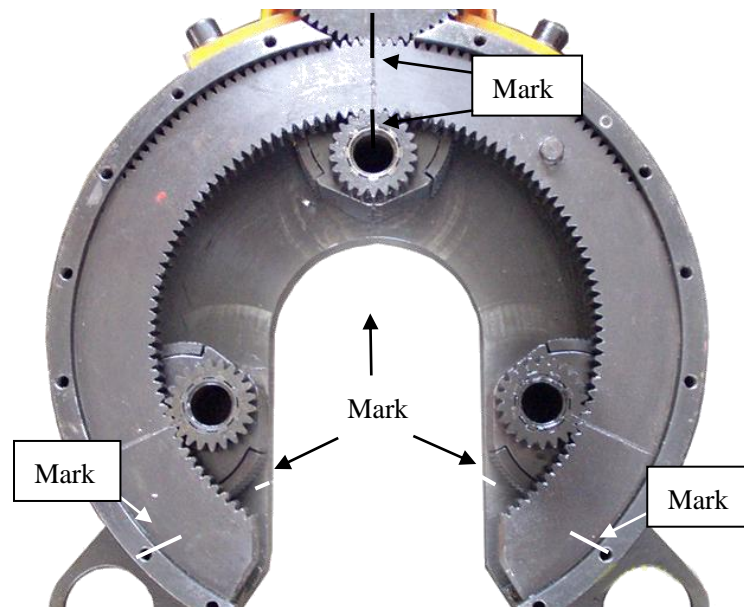


图 17



□ Mark of planetary gear- if the nick is not align with planetary claw will cause the three planetary claws cannot clamp tubule at the same time.



□ Assemble not In accordance with the rules will cause the three planetary claws cannot clamp tubule at the same time.

## 7 Maintenance

### 7.1 6.1 Daily Maintenance

- Fill 25ml of 20# engine oil to each grease nipple of the master axle, idle gear-axle, and duplex gear axle.
- Fill 25ml of 20# engine oil to each of the following points: transmission pin, friction disc, centralizing roller and jaw plate roller.
- Clean sundries from dies by wire brush.





- Clean up water and oil stain inside the tong.
- Check all parts (including jaw plate, die seat, dies and ramp plate), change or repair if they are over-worn, damaged, rusted or leaking.



- Don not clean bearing or oil nipple by steam, otherwise, parts like bearing may get rusted and damaged.
- Don not clean pressure sensor by steam, otherwise it may be damaged.



- Clean dirt in the tong and greasing oil to planetary claw is important, especially in the cold or under the condition of thick oil after working daily. Clean up oil stain of planetary claw, fill lubricating grease or lubricating oil to each sliding and rotating surface, can affect planetary claw next day work.



- Do daily maintenance and maintenance, improve work efficiency, and lengthen the service life of power tongs

## 7.2 Maintenance after one well work

- After discharge hose, the oil mouth blind up with clean plastic film, prevent debris into the oil way.
- Remove dirt of clamp body parts appearance, and using diesel oil or kerosene clean.
- Separate baffle plate, inject molybdenum disulfide grease to each gear enough.
- Fill 25ml of 20# engine oil to each gear of master tong and backup tong.
- Clear all outside the sundry, in curved tooth plate groove on the mating surface coated with anti-rust oil and planetary claw
- According to the daily maintenance of the content of the maintenance

**7.3** Inspect hydraulic motor every six month, supply oil as rule, then up break out pressure, if not reach 12, change hydraulic motor.

**7.4** Hydraulic oil supply to tong power must be effective filtrated, in case of sand and iron filings enter, affect the normal use. Filter fineness of oil not lower than 0.025mm (10mil). Recommended the following hydraulic oil

- (1) L-HS32 hydraulic oil, Apply to environmental temperature  $-30^{\circ}\text{C}$ - $+40^{\circ}\text{C}$ ;
- (2) L-HM46 hydraulic oil, Apply to environmental temperature  $0^{\circ}\text{C}$ - $+40^{\circ}\text{C}$ .



- Don not clean bearing or oil nipple by steam, otherwise, parts like bearing may get rusted and damaged.
- Don not clean pressure sensor by steam, otherwise it may be damaged.



- The temperature of the hydraulic oil should not be over 65°C. Over heating can make hydraulic system seal fail to work and slow down the running speed of tong.



- Recommend oil use in summer: L-HM46 hydraulic oil; Recommend oil use in summer or in winter: L-HS32 hydraulic oil
- Clean sediment in bottom of oil tank while changing oil.

## 8 Common Troubles and Troubles Shooting Guide

Table 3

Common troubles	causes	Remedy
Master tong slips or dies don't stretch out.	1. Wrong selection of die seat.	Replace proper die seats in pairs.
	2. Hard subjects full of the dies groove.	Clean up the subjects in the dies groove.
	3. Wrong selection of die.	Replace the die properly.
	4. Die over-worn	Replace new dies.
	5. Uneven power tong body.	Adjusting level in accordance with 4.3.
	6. Jaw plate roller or roller shaft damaged or get stuck.	Clean up parts or replace.
	7. Ramp plate worn out or damaged.	Replace ramp plate.
	8. Pipe string hardness $\geq 340\text{HB}$	Purchase special dies.
Backup tong slips or dies don't stretch out.	1. Wrong connection of hose between master and backup tongs.	Re-connect.
	2. Oil passage of master and backup tong blocked.	Clean oil channel and filler core.
	3. The above mentioned 8 causes for slippage of Master tong and backup tong.	Shoot as the above-mentioned methods.
	4. Rack plunger gets stuck.	Shoot as the above-mentioned methods.
	5. The connection point between cylinder body of tong tail and the tail seat of the backup tong damaged.	Grind or replace.
Master tong or backup tong grips but never release.	1. Roller moves out of the intended distance.	Never make up or break out at over torque; choose proper die seats.
	2. Damage of jaw plate, roller axle, ramp or jaw plate frame, etc.	Repair, grind or replace proper parts, don't work at over torque.
	3. Braking torque from tong head too small.	See the above-mentioned method.





	4.The jaw plate roller gets stuck.	Clean, grind or replace roller and roller axle.
	5.Die seats or dies of different specifications are used on the two sides of the master tong or backup tong.	Choose the right dies or die seats.
	6.Only part of the dies from master tong or backup tong clamp the pipe string.	Operate in the right way.
The operation of master tong and backup tong are not in alignment.	1.Jaw plate frame deformed or damaged.	Replace or repair.
	2.Reset bumper pin broken.	Replace the reset bumper pin,don't work at over torque.
	3.Wrong direction of the reset knob.	Turn the reset knob 180°and reset again.
Low rotating speed, but oil outlet is normal.	1.Low discharge of hydraulic pump.	Adjust oil supply to 120L/min.
	2.Viscosity of hydraulic oil too high or too low.	Replace oil or heat up (esp. in winter)
	3.Worn of pump or motor.	Replace pump or motor.
	4.Hand control valve can't slide	Adjust again.
Low rotating speed,high pressure of oil outlet.	Check valve of quick coupling can't be completely turned on or pipe blocked.	Replace quick coupling or clean the pipe.
Rotation of tong head sometimes slow, sometimes fast.	Not enough oil sucked by the hydraulic pump, air gets into the oil passage.	Clean the filter core or make up the amount of the hydraulic oil.
The motor rotates,while the tong head doesn't rotate.	The transmission axle or gear damaged.	Replace damaged parts.
Gears on both sides of the opening gear are easily stripped off	Upper and lower centralizers are severely worn.	Replace centralizers in time.
Backup tong clamps only in one direction.	Rack plunger not in the central position when jaw plate frame and the opening of backup tong main body are in alignment.	Dismount backup tong and reassemble.
Making up or breaking out too sensitive.	The valve tail nut of hand control valve gets loose.	Tighten the nut.
Gear engagement not fast, disengagement occurs easily.	1.Not pushed to the right position.	Correct operation.
	2.Pressure on the positioning seat from spring not enough.	Replace spring.
Low output torque.	1.Low system pressure.(such as overflow valve not properly adjusted or damaged)	Adjust system pressure.
	2.Pressure of pressure adjusting valve of the head control valve is adjusted too low.	Adjust at 12Mpa by special technicians.
Oil leakage from the sealing parts of the hydraulic system.	1.Lake of oil in the sensor cylinder.	Add oil to the sensor cylinder.
	2.Torque meter damaged.	Replace the torque meter.
The torque control system fails to work.	1.The signal wire connecting the hydraulic tong broken.	Reconnect or replace the signal.
	2.See the operation manual of the torque control system for further information.	
In case troubles still can't be solved,please contact our service staff.		



## 9 Portage, Storage and After Sales Service

### 9.1 Portage

- When moving the hydraulic power tong, you should handle it smoothly and keep it from moisture, don not put it upside down, keep it from damage.
- Lift it with steel wire rope with the diameter of 1/2" or bigger, keep balance of the tong.
- Don not incline or swing it too much to avoid getting damaged by hitting other things.

### 9.2 Storage

- Hydraulic power tong should be stored in a cool, dry place with good ventilation and the environment temperature should be below 45 0c.
- Don not store it in a muddy place or outdoors. Protect oil inlet and outlet well to keep sundries out.
- The storage period is generally one year after delivery for new hydraulic power tong.
- It can be used after one-year storage but the sealing parts and hoses must be changed according the actual condition.

### 9.3 Unpacking

Check the appearance of hydraulic power tong , check and accept according to the packing list.



**10 Table of Quick-wearing Accessory** (recommended storage for one tong, actual figures may vary according to the purchase period and the optional parts.)

Table 4 Quick-wearing Accessory List

Item	Purchase No.	Accessory name	application	RQ
1	XQ6C-87	Accessory name		12
2	XQ6C-90	Braking spring		4
3	XQ6C-258	Friction Disc		1 套
4	XQ6C-259	Resetting knob assembly		20 套
5	XQ6C-73	Roller		4
6	XQ6C-68	elastic cylindrical pin 5×16		16
7	XQ6C-102	Support roller		18
8	XQ6C-101	Support roller shaft		18
9	XQ6C-57	Stop pin		1
10	XQ6C-67	Die plate		20
11	XQ6C-180	Outcurve die3		20
12	XQ6C-181	Outcurve die 2		20
13	XQ6C-182	Outcurve die 1		20
14	XQ6C-260	Backup tong reset knob assembly		1set
15	XQ6C-193	Stop pin		1
16	XQ6C-218	Rack		1
17	XQ6C-214	O ring 16×2.65	Applied at the ball joint and rotary knob shaft of the high pressure hose of the backup tong.	3
18	XQ6C-136	O ring 19×3.55	Applied to 635 transition connection plate	2
19	XQ6C-140	O ring 8.5×1.8	Applied to type H reversing valve	2
20	XQ6C-142	O ring 25×2.65	Applied to backup tong valve and front guide pole assembly	1
21	XQ6C-139	O ring 21.2×2.65	Type H reversing valve	2
22	XQ6C-195	O ring 23.5×2.65	Applied to spindle of	6



			planetary clam	
23	XQ6C-228	O ring 60×3.55	Applied to backup tong tail	1
24	XQ6C-207	O ring 38.7×3.55	Applied to piston of backup tong tail	3
25	XQ6C-111	O ring 30×3.55	Applied to water shield of master tong idle gear	2
26	XQ6C-210	O ring 51.5×2.65	Applied to oil cylinder head of backup tong	2

## 11 Figures and parts list

- 11.1 Assembly and parts list (Fig.18, Table 5)
- 11.2 Master tong and parts list (Fig.19, Table 6)
- 11.3 Shell and accessory and parts list (Fig.20, Table 7)
- 11.4 Tong head assembly and parts list (Fig.21, Table 8)
- 11.5 Resetting, braking and centralizing mechanism assembly and parts list (Fig.22, Table 9)
- 11.6 Transmission mechanism and parts list (Fig.23, Table 10)
- 11.7 Hand control valve and parts list (Fig.24, Table 11)
- 11.8 Gear shifting mechanism assembly and parts list (Fig.25, Table 12)
- 11.9 Backup tong and parts list (Fig.26, Table 13)
- 11.10 Backup tong head and parts list (Fig.27, Table 14)
- 11.1 Tail seat fluid drive mechanism and parts list (Fig.28, Table 15)
- 11.12 Spring lifting bucket and parts list (Fig.29, Table 16)
- 11.13 Front guide pole assembly and parts list (Fig.30, Table 17)
- 11.14 Rear guide pole assembly and parts list (Fig.31, Table 18)

11.1 Assembly and parts list (Fig.18, Table 5)

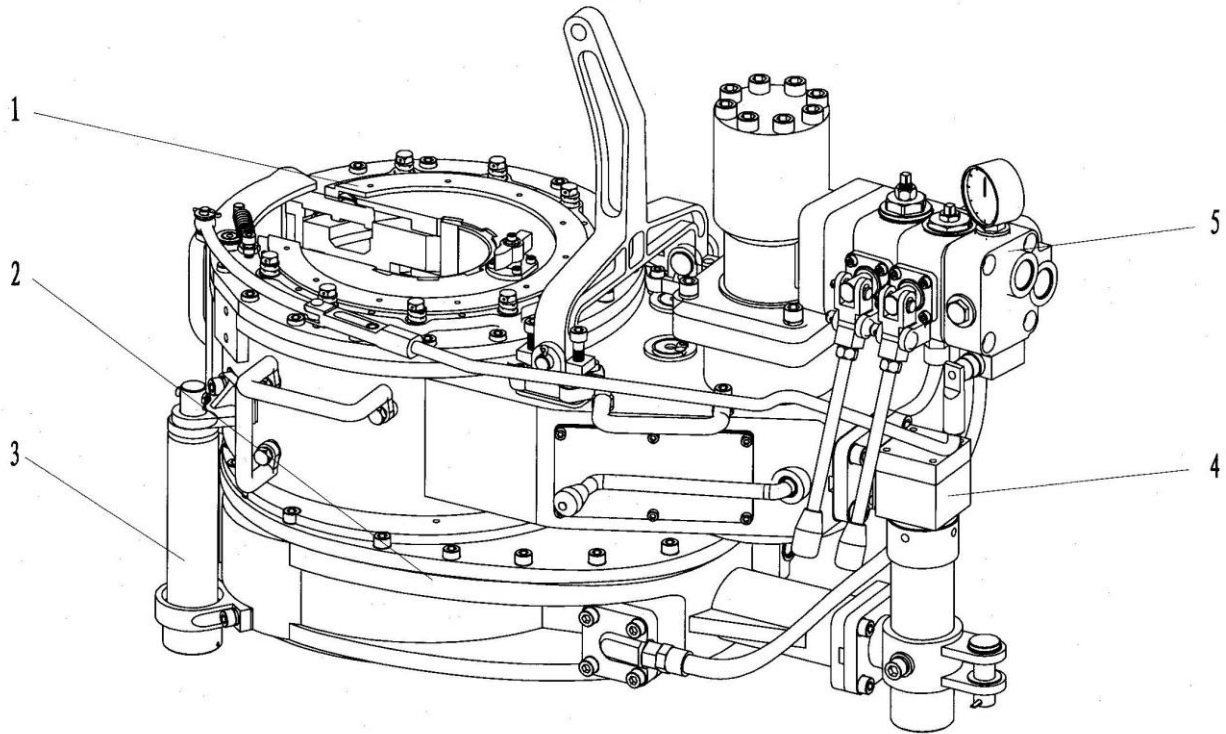


Fig.18

Table 5 Assembly parts list

NO.	P/N	Parts number	Description	Qty.
1	XQ6C-1	XQ6C.1	Master tong	1
2	XQ6C-2	XQ6C.2	Backup tong	1
3	XQ6C-3	XQ6C.3	Front guide pole assembly	2
4	XQ6C-4	XQ6C.4	Rear guide pole assembly	1
5	XQ6C-5	XQ12B.6	Control valve assembly	1

11.2 Master tong and parts list (Fig.19, Table 6)

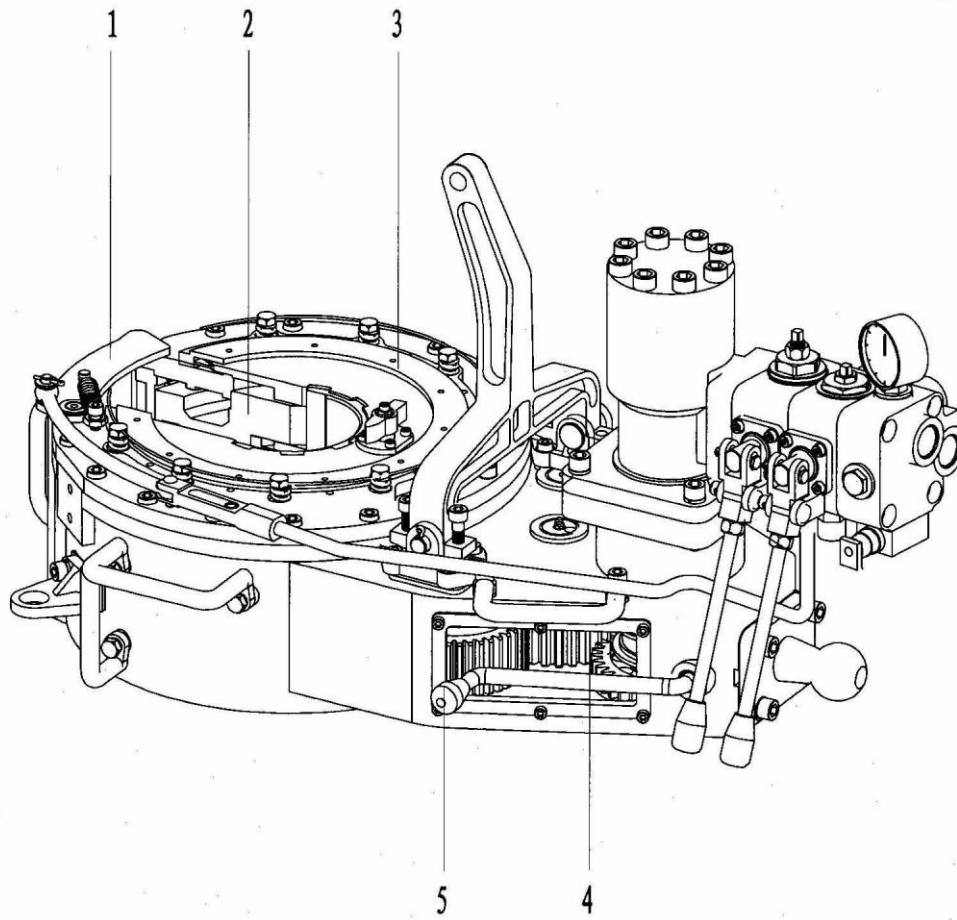


Fig.19

Table 6 Master tong parts list

NO.	P/N	Parts number	Description	Qty.
1	XQ6C-6	XQ6C.1.7	Shell assembly and safety door assembly	1
2	XQ6C-7	XQ6C.1.1	Master tong assembly	1
3	XQ6C-8		Resetting, braking and centralizing mechanism assembly parts list	1
4	XQ6C-9		Transmission mechanism assembly	1
5	XQ6C-10	XQ6C.1.5	Shifting gear assembly	1



11.3 Shell and accessory and parts list (Fig.20, Table 7)

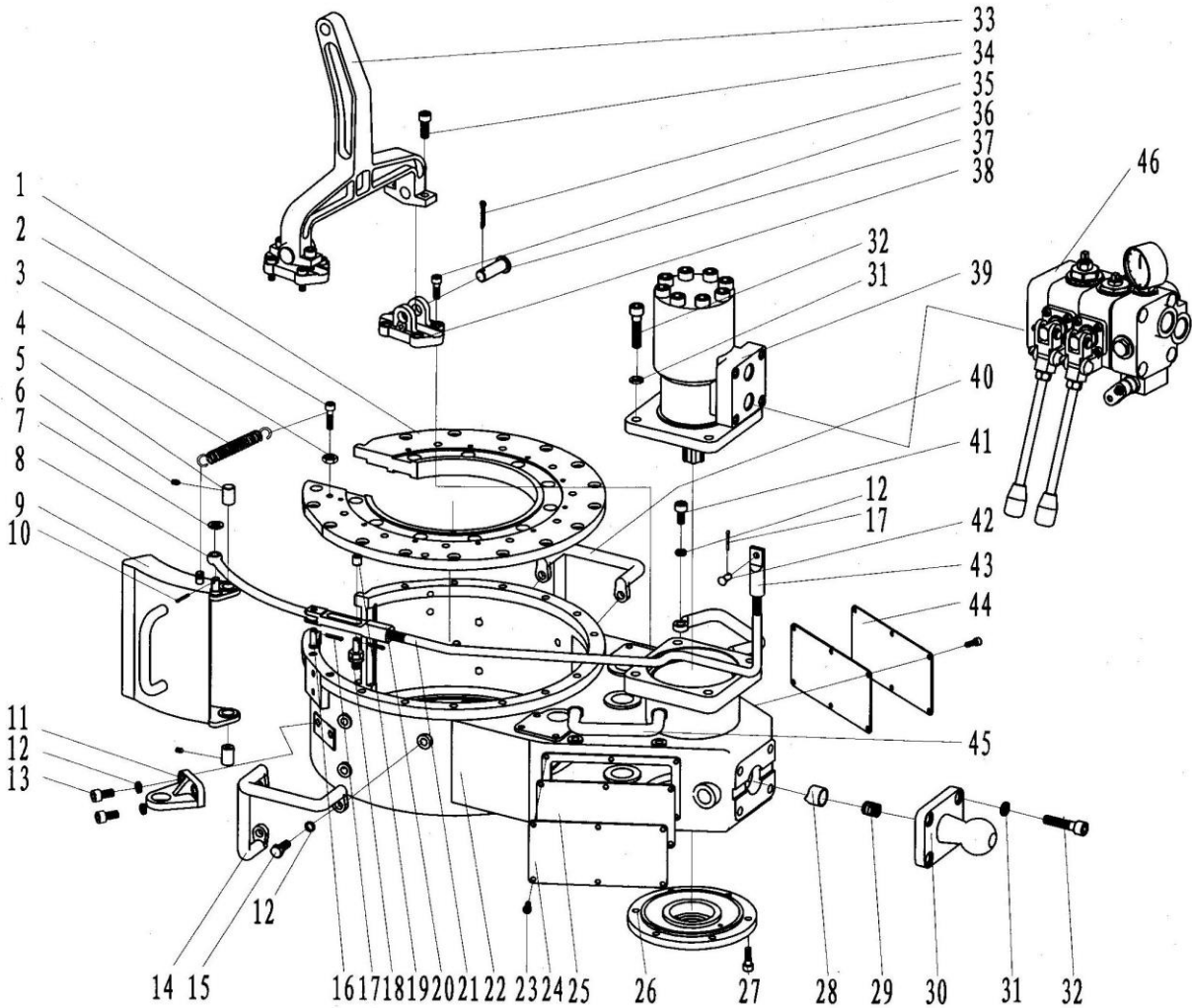


Fig.20

Table 7 Shell assembly and safety door assembly parts list

NO.	P/N	Parts number	Description	Qty.
1	XQ6C-11	XQ6C.1-17	Tong head cover	1
2	XQ6C-12	GB/T70.1	Hexagon socket head screw M8×35	1
3	XQ6C-13	GB/T93	Hexagon thin nut	1
4	XQ6C-14		Extension Spring O.D 17×95	1
5	XQ6C-15	XQ6C.1-1	Door shaft	2
6	XQ6C-16	GB/T71	Set screw M6×10	2
7	XQ6C-17	GB/T848	Small plain washer (washer 10)	1
8	XQ6C-18	XQ6C-4	Gating connecting rod (1)	1
9	XQ6C-19	XQ6C.1.7	Safety door	1
10	XQ6C-20	GB/T91	Cotter pin 2×25	1
11	XQ6C-21	XQ6C.1-2	Master tong support seat	2



## MODEL XQ114/6C HYDRAULIC POWER TONG OPERATION MANUAL

NO.	P/N	Parts number	Description	Qty.
12	XQ6C-22	GB/T93	Spring washer 10	14
13	XQ6C-23	GB/T70.1	Hexagon socket head cap screw M10×20	4
14	XQ6C-24	XYQ3C.Z.4	Front handle (left)	1
15	XQ6C-25	GB/T5780	Hexagon bolt M10×20	6
16	XQ6C-26	XQ6C-5	Gating pin shaft (2)	1
17	XQ6C-27	GB/T91	Cotter pin 3.2×16	3
18	XQ6C-28	XQ6C-3	Connecting rod strut	1
19	XQ6C-29	XQ6C-6	Connecting rod roller	1
20	XQ6C-30	XQ6C-7	Gating connecting rod connector (2)	1
21	XQ6C-31	XQ6C-8	Gating connecting rod (2)	1
22	XQ6C-32	XQ6C.1-3	Shell	1
23	XQ6C-33	GB/T70.1	Hexagon socket head cap screw M6×10	12
24	XQ6C-34	XQ6C.1-20	Press and torque corresponding plate	1
25	XQ6C-35	XQ6C.1-26	Baffle plate	2
26	XQ6C-36	XQ6C.1-11	Bottom cover	1
27	XQ6C-37	GB/T70.1	Hexagon socket head cap screw M8×20	6
28	XQ6C-38	XQ6C.1-34	Sliding block	1
29	XQ6C-39	XQ6C.1-35	Spring	1
30	XQ6C-40	XQ6C.1-12	Rear guide pole seat	1
31	XQ6C-41	GB/T93	Spring washer12	8
32	XQ6C-42	GB/T70.1	Hexagon socket head cap screw M12×45	8
33	XQ6C-43	XYQ6B.Z-75	Suspension rod	1
34	XQ6C-44	GB/T70.1	Hexagon socket head cap screw M10×30	4
35	XQ6C-45	GB/T91	Cotter pin 4×30	2
36	XQ6C-46	GB/T70.1	Hexagon socket head cap screw M8×25	8
37	XQ6C-47	GB/T882	Pin shaft B16×45	2
38	XQ6C-48	XQ6C.1-36	Suspension seat	2
39	XQ6C-49		Hydraulic motor 6K390	1
40	XQ6C-50	XYQ3C.Z.3	Front handle (right)	1
41	XQ6C-51	GB/T70.1	Hexagon socket head cap screw M10×20	4
42	XQ6C-52	XQ6C-1	Gating pin shaft (2)	1
43	XQ6C-53	XQ6C-2	Gating connecting rod connector (1)	1
44	XQ6C-54	XQ6C.1-28	Product mark plate	1
45	XQ6C-55	XYQ3C.Z-37	Rear handle	2
46	XQ6C-56	XQ12B.6	Control valve assembly	1



11.4 Tong head assembly and parts list (Fig.21, Table 8)

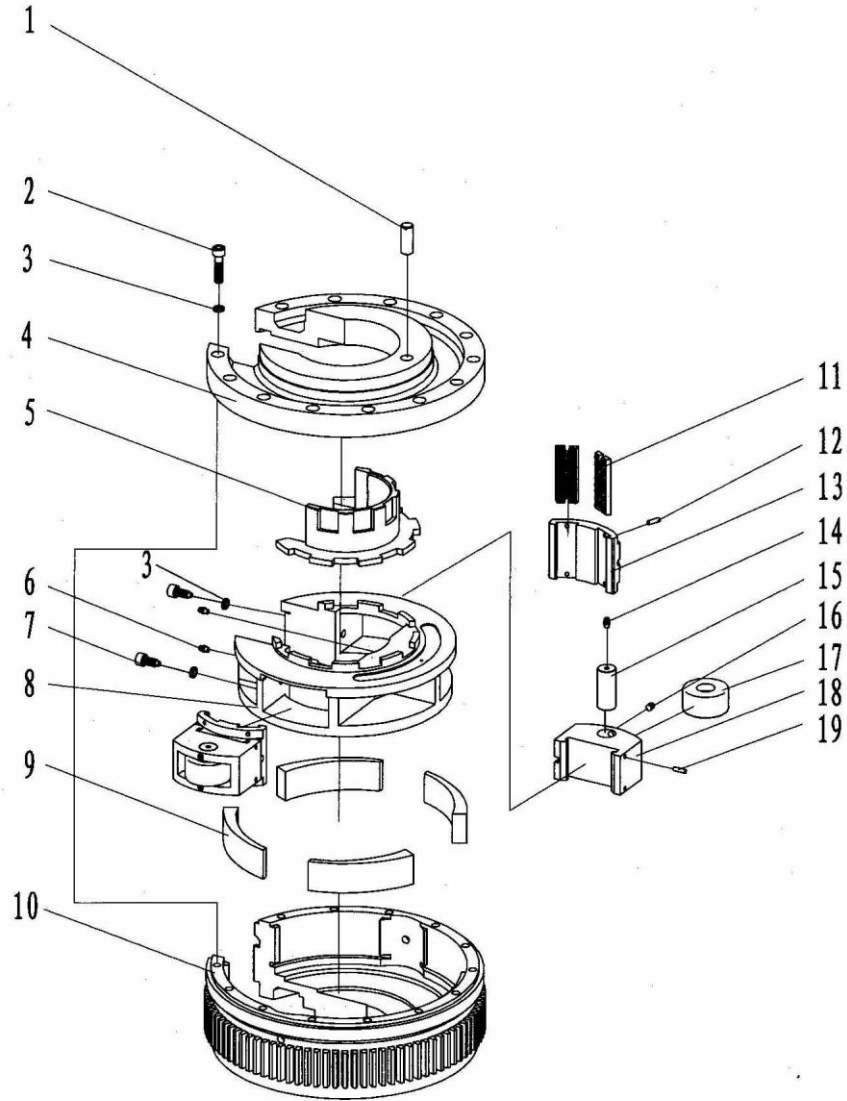


Fig.21



Table 8 Tong head assembly parts list

NO.	P/N	Parts number	Description	Qty.
1	XQ6C-57	XQ6C.1.1-12	Stop pin	1
2	XQ6C-58	GB/T70.1	Hexagon socket head cap screw M10×40	17
3	XQ6C-59	GB/T93	Spring washer10	19
4	XQ6C-60	XQ6C.1.1-1	Open gear cover	1
5	XQ6C-61	XQ6C.1.1-2	Spline plate	1
6	XQ6C-62	GB/T1152	Oil cup M6	2
7	XQ6C-63	XQ6C.1.1-11	Stop screw M10×25	2
8	XQ6C-64	XQ6C.1.1-3	Jaw plate	1
9	XQ6C-65	XQ6C.1.1-5	Ramp	4
10	XQ6C-66	XQ6C.1.1-4	Open gear	1
11	XQ6C-67	XQ6C.1.1-9	Die	4
12	XQ6C-68	GB/T879.1	Elastic cylindrical pin 5×16	8
13	XQ6C-69(1-4)	XQ6C.1.1-10(1)-(4)	Die seat (1)-(4)	2×4
14	XQ6C-70	GB/T1155	Hydraulic grease nipple 6	2
15	XQ6C-71	XQ6C.1.1-8	Roller shaft	2
16	XQ6C-72	GB/T75	Stop screw M8×12	2
17	XQ6C-73	XQ6C.1.1-6	Roller	2
18	XQ6C-74	XQ6C.1.1-7	Jaw plate	2
19	XQ6C-75	GB/T119.2	Straight pin 5×16	4

11. 5 Resetting, braking and centralizing mechanism assembly and parts list (Fig.22, Table 9)

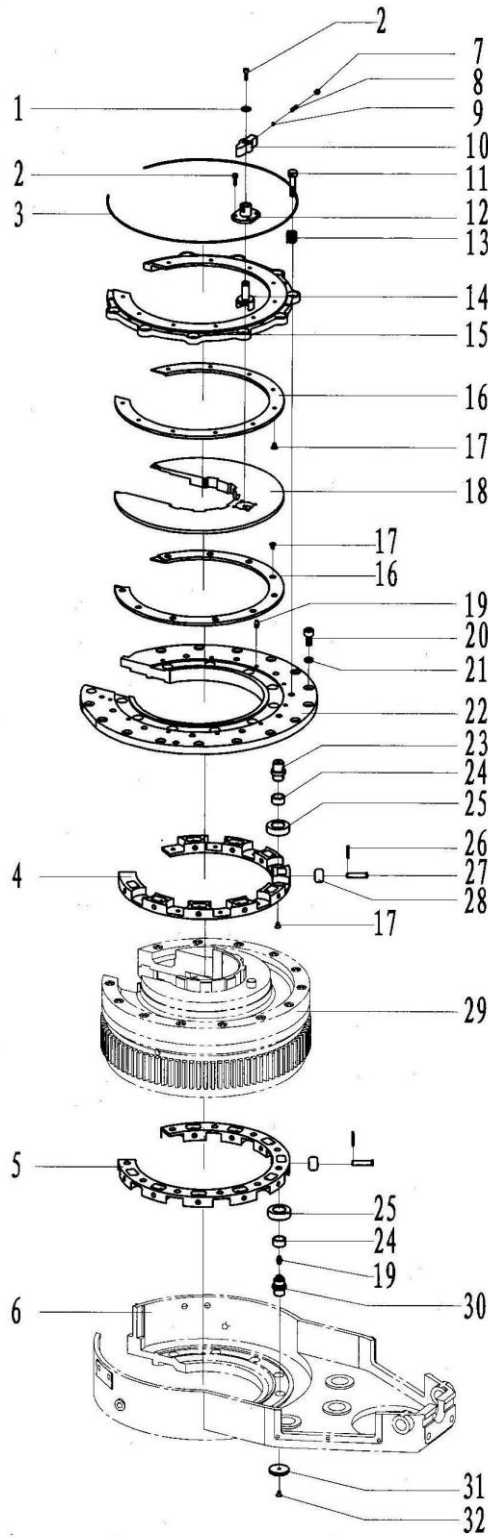


Fig.21



Table 9 Resetting, braking and centralizing mechanism assembly parts list

NO.	P/N	Parts number	Description	Qty.
1	XQ6C-76	GB/T96	Washer 5	1
2	XQ6C-77	GB/T70.1	Hexagon socket head cap screw M5×16	5
3	XQ6C-78		Steel wire Φ2×700	1
4	XQ6C-79	XQ6C.1.2-1	Roller support plate (upper)	1
5	XQ6C-80	XQ6C.1.3-1	Roller support plate (below)	1
6	XQ6C-32	XQ6C.1-3	shell	1
7	XQ6C-81	GB/T73	Stop pin M8×8	1
8	XQ6C-82	XQ6C.1.6-4	Reset knob spring	1
9	XQ6C-83		Steel ballΦ5	1
10	XQ6C-84	XQ6C.1.6-5	Reset knob	1
11	XQ6C-85	GB/T32.1	Hexagon bolt with wire holes on head M10×40	9
12	XQ6C-86	XQ6C.1.6-1	Reset knob shaft cover	1
13	XQ6C-87	XYQ3B.Z-6	Spring	9
14	XQ6C-88	XQ6C.1.6-3	Reset knob shaft	1
15	XQ6C-89	XQ6C.1-19	Braking plate	1
16	XQ6C-90	XQ6C.1-18	Friction plate	2
17	XQ6C-91	GB/T68	Countersunk head screw M5×8	30
18	XQ6C-92	XQ6C.1.6-2	Braking steel plate	1
19	XQ6C-93	GB/T1155	Hydraulic grease nipple 6	30
20	XQ6C-94	GB/T70.1	Hexagon socket head cap screw M10×20	15
21	XQ6C-95	GB/T93	Spring washer10	15
22	XQ6C-96	XQ6C.1-17	Tong head cover	1
23	XQ6C-97	XQ6C.1-32	Upper centering roller shaft	10
24	XQ6C-98	XQ6C.1-30	Centering roller shaft cover	20
25	XQ6C-99	XQ6C.1-29	Centering roller	20
26	XQ6C-100	GB/T91	Cotter pin.5×14	18
27	XQ6C-101	XQ6C.1.2-3	Support roller shaft	18
28	XQ6C-102	XQ6C.1.2-2	Support roller	18
29	XQ6C-7	XQ6C.1.1	Tong head assembly	1
30	XQ6C-103	XQ6C.1-31	Below centering roller shaft	10
31	XQ6C-104	GB/T891	Retaining ring of shaft end B22	10
32	XQ6C-105	GB/T68	Countersunk head screw M5×10	10

11.6 Transmission mechanism and parts list (Fig.23, Table 10)

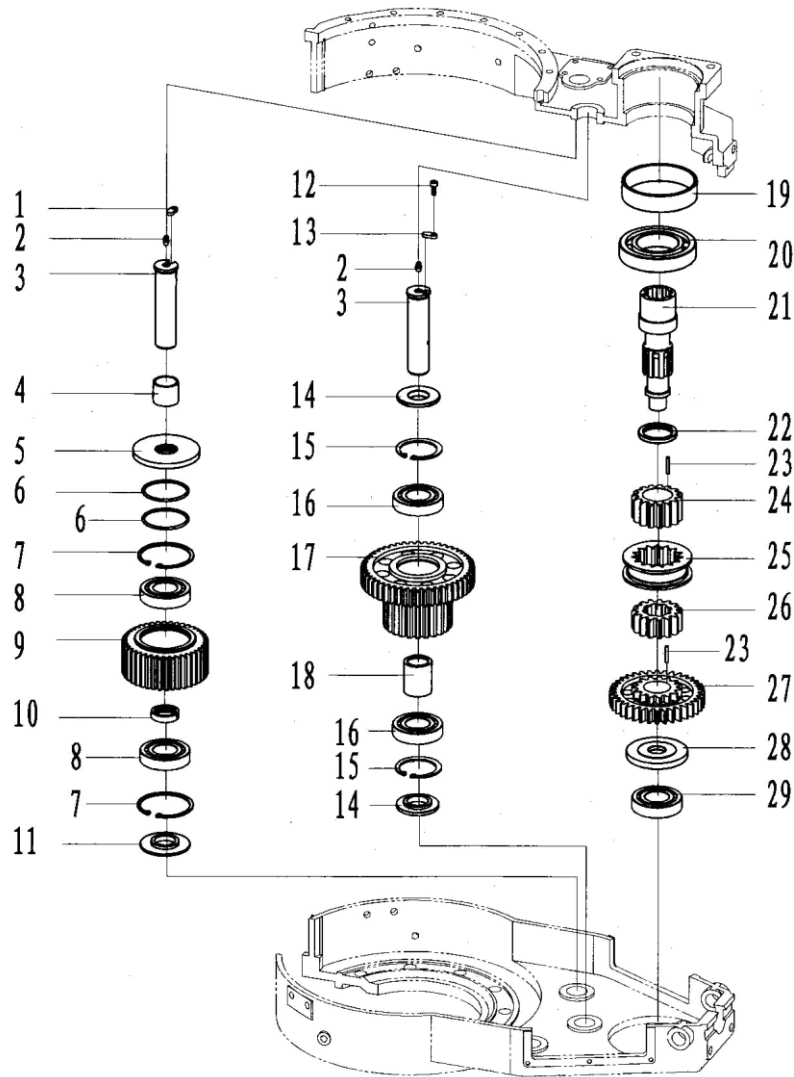


Fig.23



Table 10 Transmission mechanism parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-106	XQ3C.Z-5	Position plate of idle gear shaft	2
2	XQ6C-107	JB/T7940.1	Oil cup M8×1	3
3	XQ6C-108	XQ6C.1-5	Idle gear shaft (Duplex gear shaft)	3
4	XQ6C-109	XQ6C.1-23	Idle gear bushing	2
5	XQ6C-110	XQ6C.1-24	Water proof cover	2
6	XQ6C-111	GB/T3452.1	O ring 30×3.55	2
7	XQ6C-112	GB/T893.1	Circlip for hole 72	4
8	XQ6C-113	GB/T283	Cylindrical roller bearing NJ306E	4
9	XQ6C-114	XQ6C.1-25	Idle gear	2
10	XQ6C-115	XQ6C.1-22	Idle gear spacer ring	2
11	XQ6C-116	XQ6C.1-21	Retainer plate	2
12	XQ6C-117	GB/T70.1	Hexagon socket head cap screw M6×12	1
13	XQ6C-118	XQ6C.1-27	Locating plate of duplex gear	1
14	XQ6C-119	XQ6C.1-7	Duplex gear	2
15	XQ6C-120	GB/T893.1	Circlip for hole 62	2
16	XQ6C-121	GB/T283	Cylindrical roller bearing NJ2206E	2
17	XQ6C-122	XQ6C.1-4	Duplex gear	1
18	XQ6C-123	XQ6C.1-6	Spacer ring of duplex gear	1
19	XQ6C-124	XQ6C.1-14	Motor lining	1
20	XQ6C-125	GB/T276	Ball bearing 6310-2Z	1
21	XQ6C-126	XQ6C.1-10	Power input shaft	1
22	XQ6C-127	XQ6C.1-15	Centralizing washer	1
23	XQ6C-128	GB/T309	Needle roller 4×25.8	57
24	XQ6C-129	XQ6C.1-13	Gear shift roller	1
25	XQ6C-130	XQ6C.1-8	Inner gear sleeve	1
26	XQ6C-131	XQ6C.1-9	Spline gear	1
27	XQ6C-132	XQ6C.1.4	Clutch gear assembly	1
28	XQ6C-133	XQ6C.1-33	Waterproof plate	1
29	XQ6C-134	GB/T276	Ball bearing 6305	1

11.7 Hand control valve and parts list (Fig.24, Table 11)

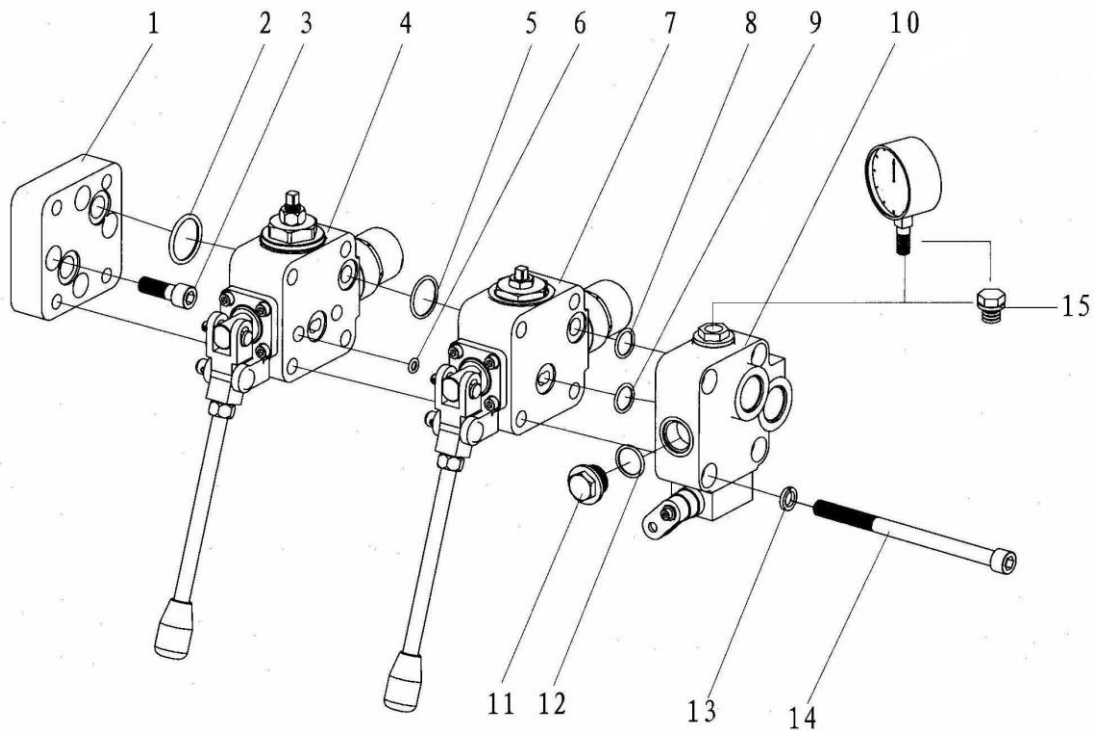


Fig.24

Table 11 Hand control valve parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-135	XQ12B.6-1	625 transitional connection plate	1
2	XQ6C-136	GB/T3452.1	O ring 19×3.55	2
3	XQ6C-137	GB/T70.1	Hexagon socket head cap screwM12×35	4
4	XQ6C-138	3HXF.0	H hand control valve (small)	1
5	XQ6C-139	GB/T3452.1	O ring 21.2×2.65	2
6	XQ6C-140	GB/T3452.1	O ring 8.5×1.8	2
7	XQ6C-141	BQF.0	Backup tong valve	1
8	XQ6C-142	GB/T3452.1	O ring 25×2.65	1
9	XQ6C-143	GB/T3452.1	O ring 38.7×3.55	1
10	XQ6C-144	MKF.0	Gating control valve	1
11	XQ6C-145	XQ12B.6-2	Plug	1
12	XQ6C-146	GB/T3452.1	O ring 21.2×2.65	1
13	XQ6C-147	GB/T93	Standard spring washer12	4
14	XQ6C-148	GB/T70.1	Hexagon socket head cap screwM12×155	4
15	XQ6C-261	XQ3C.Z.5-12	Plug	1
	XQ6C-262		Pressure gageΦ60,0—16MPa	

### 11.8 Gear shifting mechanism assembly and parts list (Fig.25, Table 12)

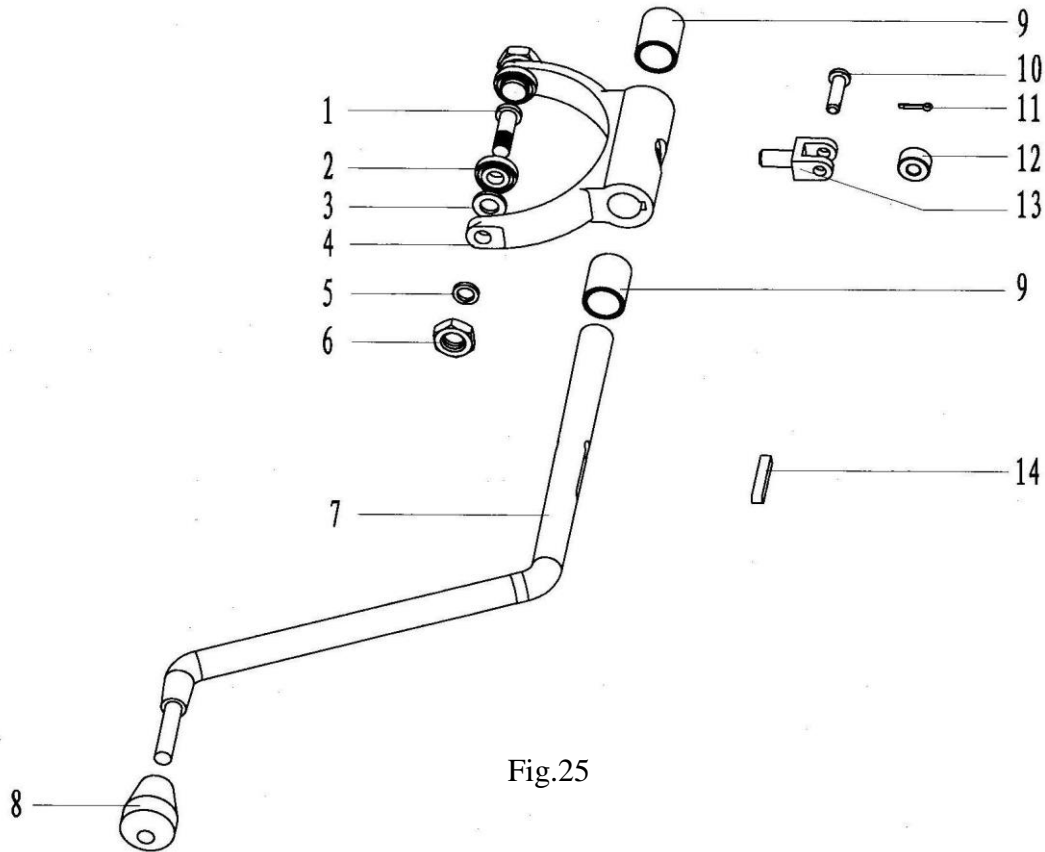


Fig.25

Table 12 Gear shifting mechanism assembly parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-149	XQ6C.1.5-7	Stud shaft	2
2	XQ6C-150	GB/T276	Ball bearing	2
3	XQ6C-151	GB/T848	Ball washer (washer 8)	2
4	XQ6C-152	XQ6C.1.5-1	Shifting fork	1
5	XQ6C-153	GB/T93	Spring washer (washer 8)	2
6	XQ6C-154	GB/T41	Hexagon nut M8	2
7	XQ6C-155	XQ6C.1.5-6	Shifting fork shaft	1
8	XQ6C-156	XQ6C.1.5-8	Handle	1
9	XQ6C-157	XYQ3C.Z.6-1	Sliding bearing	2
10	XQ6C-158	XQ6C.1.5-3	Roller shaft	1
11	XQ6C-159	GB/T91	Cotter pin 2×10	1
12	XQ6C-160	XQ6C.1.5-2	Lock roller	1
13	XQ6C-161	XQ6C.1.5-4	Roller seat	1
14	XQ6C-162	XQ6C.1.5-5	Flat key	1



11.9 Backup tong and parts list (Fig.26, Table 13)

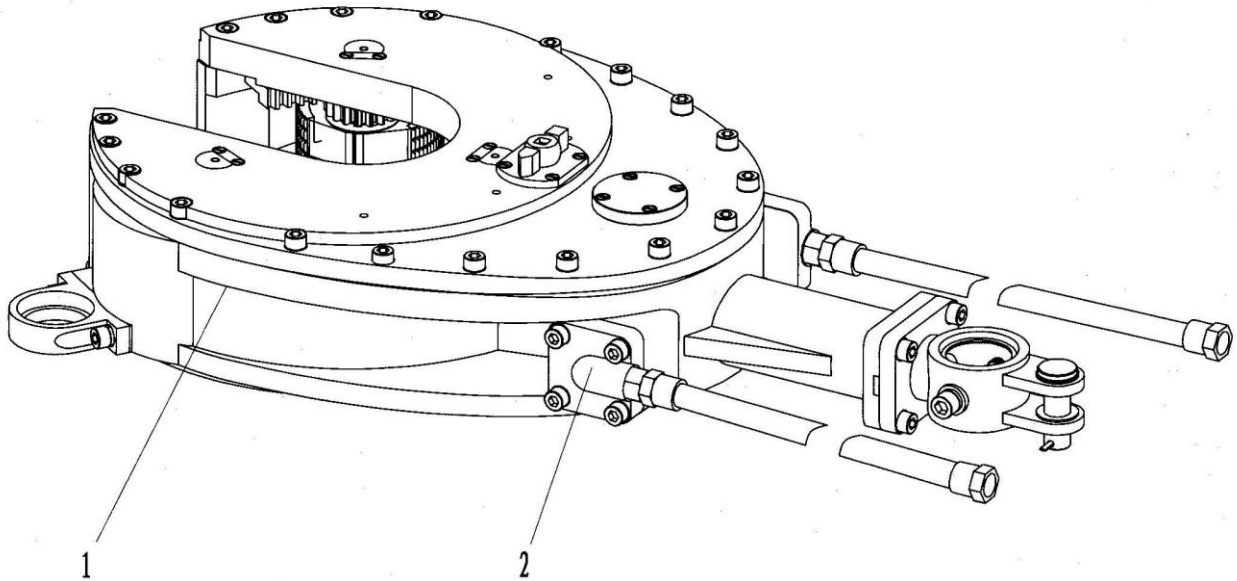


Fig.26

Table 13 Backup tong parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-163		Tail seat head	1
2	XQ6C-164		Tail seat of backup tong	1

11.10 Backup tong head and parts list (Fig.27, Table 14)

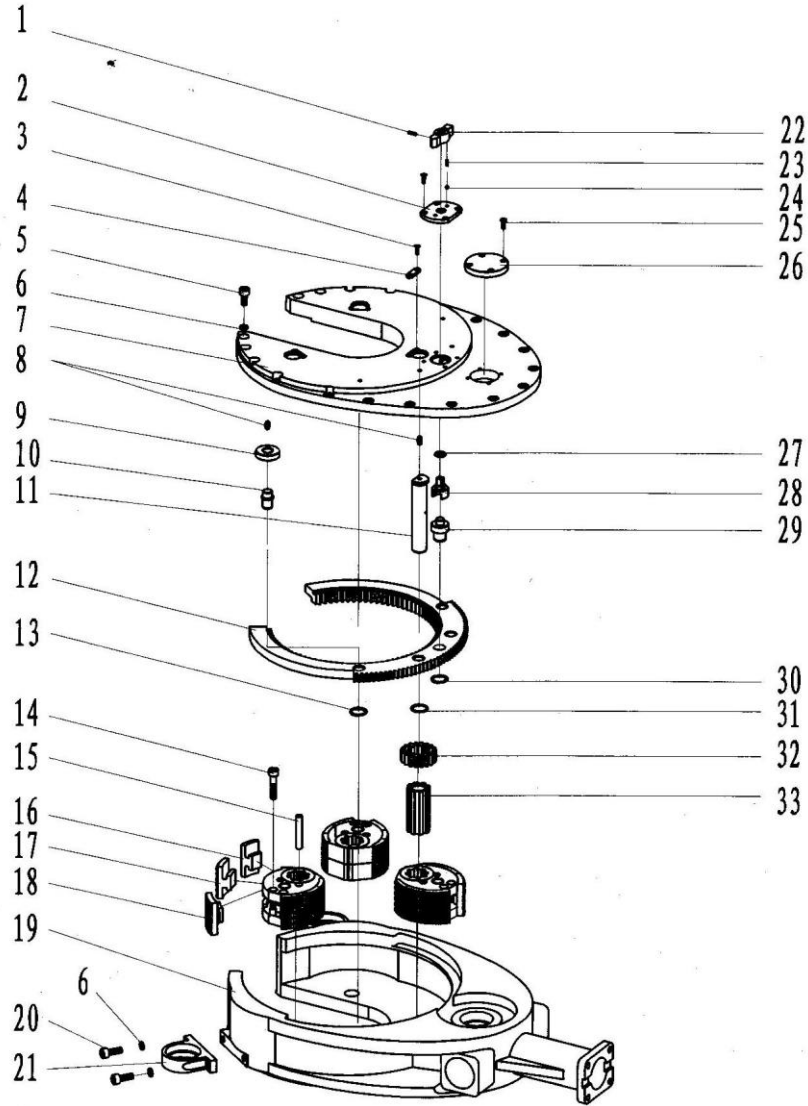


Fig.27



Table 14 Backup tong head parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-165	GB/T73	Stop screw M5×16	1
2	XQ6C-166	XQ6C.2-15	Rotary knob cover	1
3	XQ6C-167	GB/T68	Countersunk head screw M5×14	10
4	XQ6C-168	XQ6C.2-4	Position plate	3
5	XQ6C-169	GB/T70.1	Hexagon socket head cap screwM10×20	19
6	XQ6C-170	GB/T93	Spring washer 0	23
7	XQ6C-171	XQ6C.2-2	Backup tong upper cover	1
8	XQ6C-172	GB/T1155	Hydraulic grease nipple 6	7
9	XQ6C-173	20XA.2-8	Roller	4
10	XQ6C-174	20XA.2-7	Shaft	4
11	XQ6C-175	XQ6C.2-7	Planetary claw shaft	3
12	XQ6C-176	XQ6C.2-8	Gear ring	1
13	XQ6C-177	GB/T894.1	Circlip for shaft16	4
14	XQ6C-178	GB/T70.1	Hexagon socket head cap screwM10×45	6
15	XQ6C-179	GB/T119	Cylindrical pin B10×60	6
16	XQ6C-180	XQ6C.2.1-3	Outcurve die plate 3	6
17	XQ6C-181	XQ6C.2.1-2	Outcurve die plate 2	6
18	XQ6C-182	XQ6C.2.1-1	Outcurve die plate 1	6
19	XQ6C-183	XQ6C.2-3	Backup tong body	1
20	XQ6C-184	GB/T70.1	Hexagon socket head cap screwM10×25	4
21	XQ6C-185	XQ6C.2-1	Front support seat of backup tong	2
22	XQ6C-186	XQ12B.2-22	Rotary knob	1
23	XQ6C-187	XQ3C.B-10	Spring	2
24	XQ6C-188	GB308-89	Steel ballΦ5	2
25	XQ6C-189	GB/T68	Countersunk head screw M5×12	4
26	XQ6C-190	XQ6C.2-10	Cover plate	1
27	XQ6C-191	GB/T3452.1	O ring 16×2.65	1
28	XQ6C-192	XQ6C.2-13	Rotary knob shaft	1
29	XQ6C-193	XQ6C.2-14	Stop pin	1
30	XQ6C-194	GB/T894.1	Circlip for shaft 20	1
31	XQ6C-195	GB/T3452.1	O ring 23.5×2.65	6
32	XQ6C-196	XQ6C.2-5	Planetary gear	3
33	XQ6C-197	XQ6C.2-6	Spline shaft	3

11.11 Tail seat fluid drive mechanism and parts list (Fig.28, Table 15)

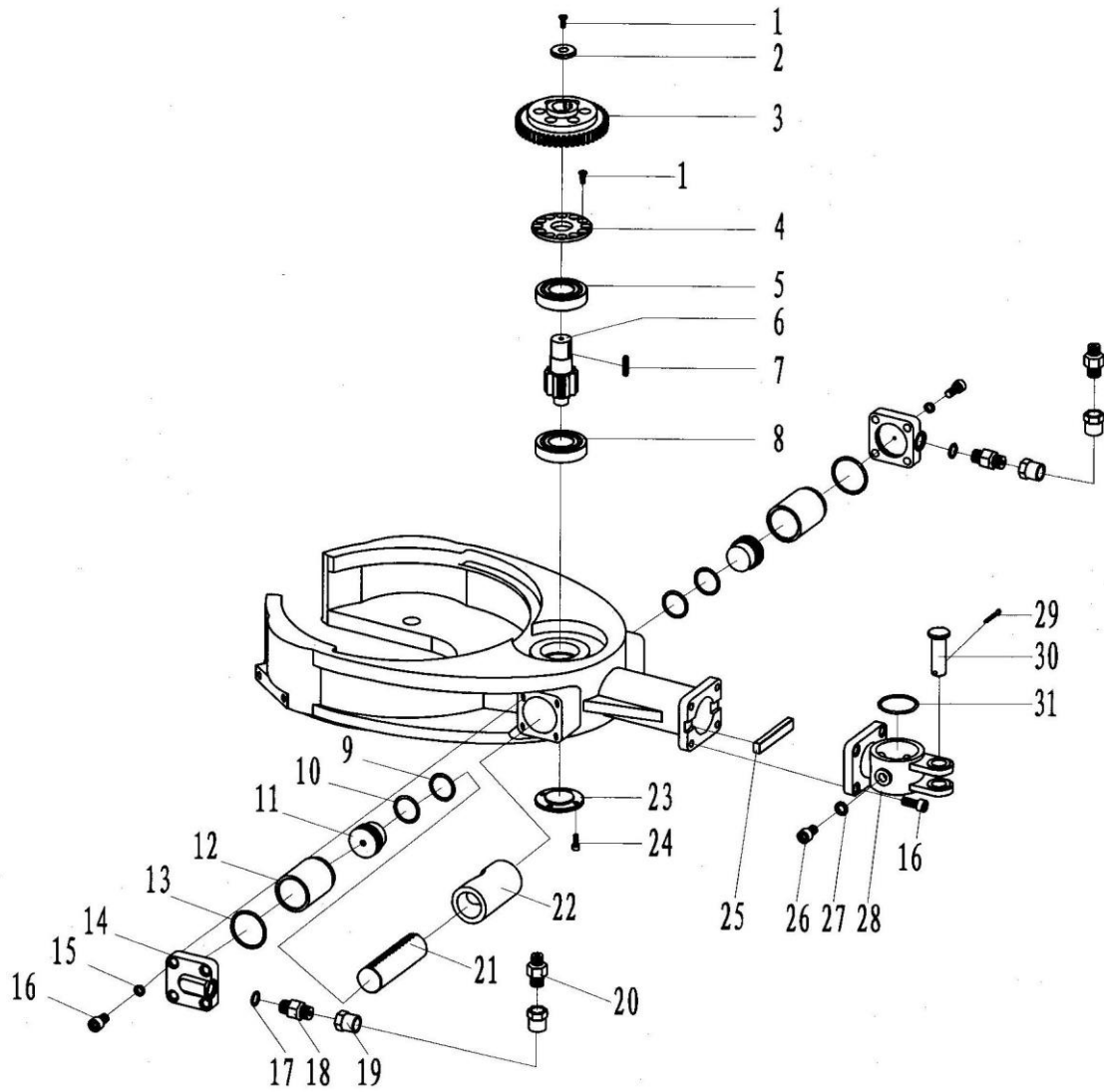


Fig.28



Table 15 Tail seat fluid drive mechanism parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-198	GB/T68	Countersunk head screwM6×12	5
2	XQ6C-199	GB/T891	Shaft end stop ring	1
3	XQ6C-200	XQ6C.2-9	Gear	1
4	XQ6C-201	20XA.2-17	Upper bearing cover	1
5	XQ6C-202	GB/T276	Ball bearing6106	1
6	XQ6C-203	20XA.2-18	Gear shaft	1
7	XQ6C-204	GB/T1096	Flat key 8×22	2
8	XQ6C-205	GB/T283	Roller bearing NJ204E	1
9	XQ6C-206		O ring 45×39×1.5	2
10	XQ6C-207	GB/T3452.1	O ring 38.7×3.55	2
11	XQ6C-208	20XA.2-25	Piston	2
12	XQ6C-209	XQ6C.2-11	Cylinder sleeve	2
13	XQ6C-210	GB/T3452.1	O ring 51.5×2.65	2
14	XQ6C-211	20XA.2-26	Oil cylinder cover	2
15	XQ6C-212	GB/T93	Spring washer10	8
16	XQ6C-213	GB/T70.1	Hexagon socket head cap screwM1030	12
17	XQ6C-214	GB/T3452.1	O ring 16×2.65	2
18	XQ6C-215	YG-3	Adapter (M18×1.5-M18×1.5)	2
19	XQ6C-216	JB/ZQ4424	Hose 10 II -900/1000 (M18×1.5)	各1
20	XQ6C-217	YG-2	Adapter (M16×1.5-M18×1.5)	2
21	XQ6C-218	XQ6C.2-12	Rack	1
22	XQ6C-219	20XA.2-27	Rack sleeve	1
23	XQ6C-220	XQ12B.2-21	Lower ball cover	1
24	XQ6C-221	GB/T70.1	Hexagon socket head cap screwM6×12	4
25	XQ6C-222	XQ6C.2-18	Flat key	1
26	XQ6C-223	XQ6C.2-16	Positioning screw	2
27	XQ6C-224	GB/T93	Spring washer 12	2
28	XQ6C-225	XQ6C.2-17	Tail seat of backup tong	1
29	XQ6C-226	GB/T91	Cotter pin 5×32	1
30	XQ6C-227	GB/T882	Pin shaft 20×55	1
31	XQ6C-228	GB/T3452.1	O ring 60×3.55	1

11.12 Spring lifting bucket and parts list (Fig.29, Table 16)

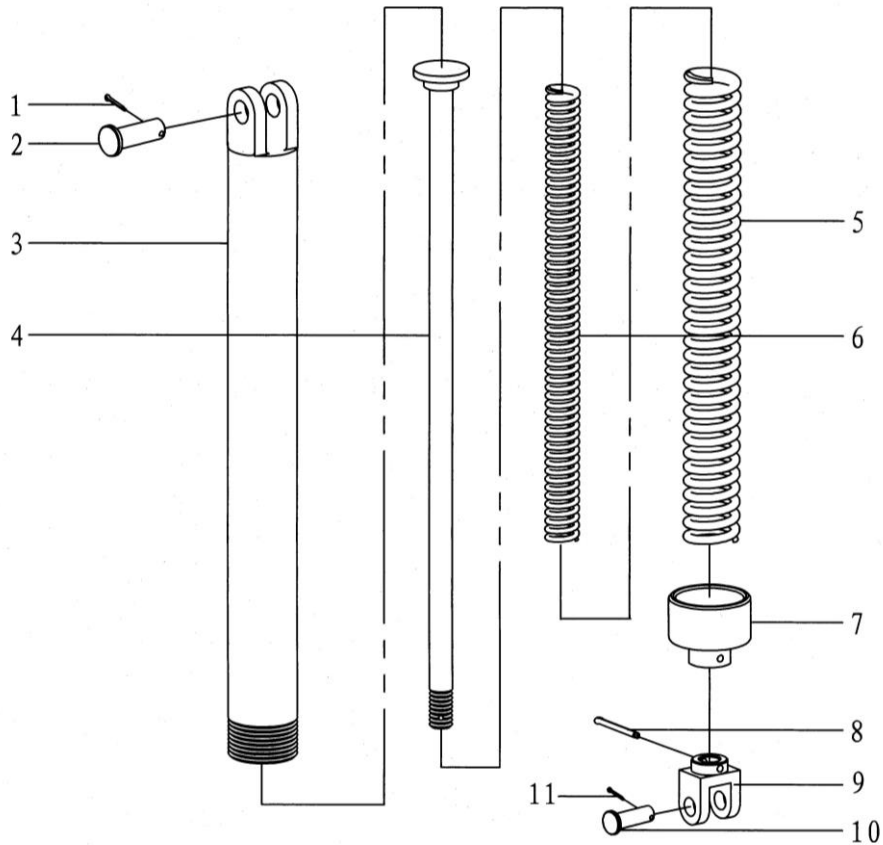


Fig.29

Table 16 Spring lifting bucket parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-229	GB/T91	Cotter pin 4×30	1
2	XQ6C-230	GB/T882	Pin shaft B20×60	1
3	XQ6C-231	XYQ3C.DT.2	Lifting bucket body assembly	1
4	XQ6C-232	XYQ3C.DT.1	Sponder assembly	1
5	XQ6C-233	XYQ3C.DT-3	Sponder large spring	1
6	XQ6C-234	XYQ6B.DT-1	Vice-spring	1
7	XQ6C-235	XYQ3C.DT-2	Sponder end cover	1
8	XQ6C-236	GB/T91	Cotter pin 5×50	1
9	XQ6C-237	XYQ3C.DT-1	Sponder earring ring	1
10	XQ6C-238	GB/T882	Pin shaft B16×55	1
11	XQ6C-239	GB/T91	Cotter pin 3.2×26	1

11.13 Front guide pole assembly and parts list (Fig.30, Table 17)

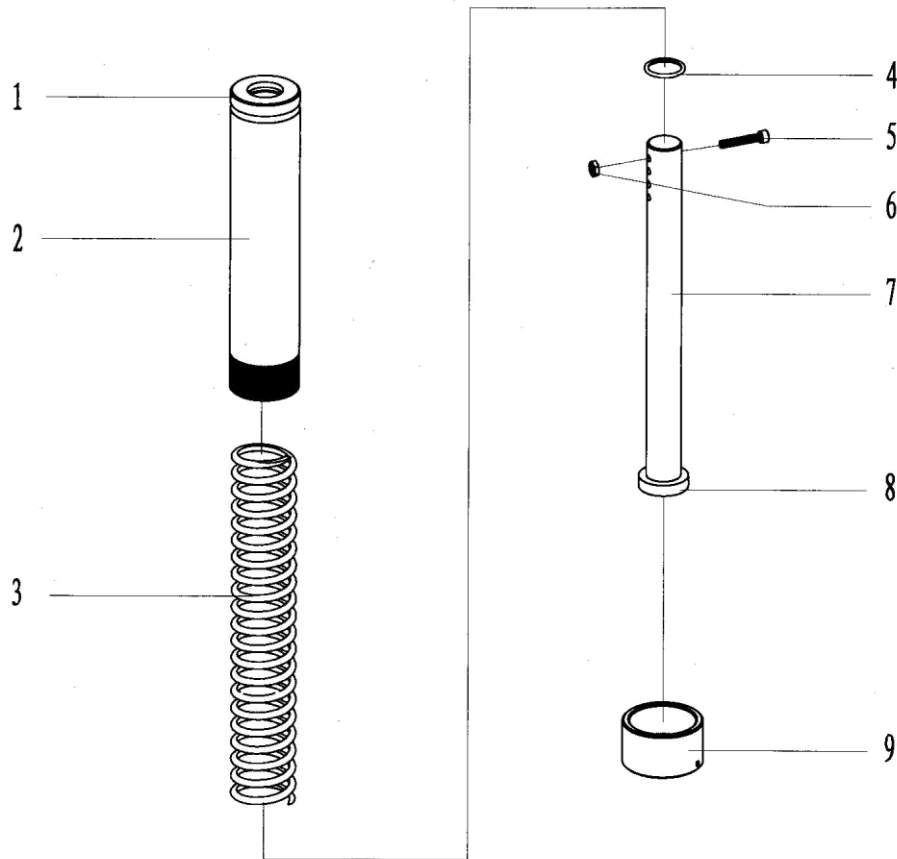


Fig.30

Table 17 Front guide pole assembly parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-240	XQ6C.3-1	Front end plate	2
2	XQ6C-241	XQ6C.3-3	Front guide pole body	2
3	XQ6C-242	XQ6C.3-2	Front guide pole spring	2
4	XQ6C-243	GB/T3452.1	O ring 25×2.65	2
5	XQ6C-244	GB/T70.1	Hexagon socket head cap screw M5×30	2
6	XQ6C-245	GB/T41	Hexagon nut M5	2
7	XQ6C-246	XQ6C.3-4	Front guide pole	2
8	XQ6C-247	XQ6C.3-6	Front guide pole bench	2
9	XQ6C-248	XQ6C.3-5	Front guide pole seat	2

11.14 Rear guide pole assembly and parts list (Fig.31,Table 18)

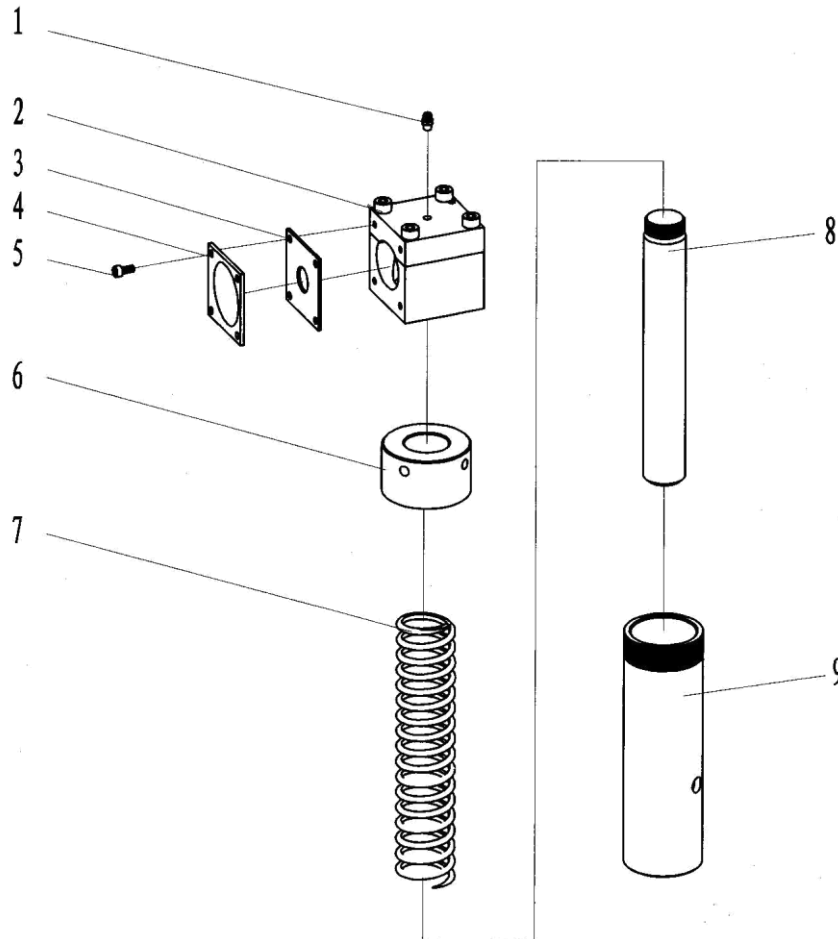


Fig.31

Table 18 Rear guide pole assembly parts list

Item	P/N	Part number	Description	Qty
1	XQ6C-249	GB/T1152	Oil cupM6	1
2	XQ6C-250	XQ6C.4.1	Universal joint	1
3	XQ6C-251	XQ6C.4-4	Rubber gasket	1
4	XQ6C-252	XQ6C.4-3	Glue cushion binder plate	1
5	XQ6C-253	GB/T70.1	Hexagon socket head cap screwM5×12	4
6	XQ6C-254	XQ6C.4-2	End cap	1
7	XQ6C-255	XQ6C.4-1	Rear guide pole spring	1
8	XQ6C-256	XQ6C.4.3	Rear guide pole	1
9	XQ6C-257	XQ6C.4.2	Rear guide pole outer barrel	1



